October 1977 Number 398 -Part I

P-A STACKS

NOV 18 1977

Solar-Geophysical Data prompt reports

Data for September 1977–August 1977

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

ERRATA PAGE 105

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Solar - Geophysical Data

NO. 398 OCTOBER 1977

Part I (Prompt Reports)

DATA FOR
SEPTEMBER 1977
AUGUST 1977

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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Solar-Geophysical Data, 390 Part I (or Part II), pages, February 1977, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302).

SOLAR - GEOPHYSICAL DATA

No. 398

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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C.4d	Solar Radio Spectral Obs. (Culgoora)	387B 32	389B 29	389B 32	389A 92	391B 47	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103		
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F.1b	Cosmic Ray Neutron Counts (Climax)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	
F.1e	Cosmic Ray Neutron Counts (Alert)	386A 99	387A103	388A103	389A 97	390A106	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	
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F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)	386A 99	387A103	388A103	389A 97	390A106	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109		
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F.1i	Cosmic Ray Neutron Counts (Kiel)	386A 99	387A103	388A103	389A 97	390A106	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	
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Note: A = Part I, B = Part II.

386A 22 listed under 1976 Aug shows that data for August 1976 were contained in *Solar-Geophysical Data* Number 386 - Part I beginning on page 22.

SEPTEMBER 1977 DATA

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ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

SEPTEMBER 1977

PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).
07 SEPTEMBER 1977, BOULDER 07/2335Z BOULDER PRESTO TENFLARE 1900 FLUX UNITS 07/2258Z OPTICAL FLARE BEHIND N.E. LIMB (X-2 IN X-RAYS).
09 SEPTEMBER 1977, SOFLARE 2B N10E80 091604Z 51 MIN. DURATION, PARALLEL RIBBONS WITH UMBRAL COVERAGE, TENFLARE 1087 FLUX UNITS 09/1647Z IN PROGRESS.
16 SEPTEMBER 1977, SOFLARE 2B N08W22 162120Z 145 MIN., 1ST MAXIMUM 2140Z, 2ND MAXIMUM 2303Z, TENFLARE 1700 FLUX UNITS 16/2128Z IN PROGRESS.
19 SEPTEMBER 1977, MAGSTORM BEGINS 19/1305Z SOFLARE 3B N09W49 191045Z 77 MIN. POLCAP ABSORPTION 191600Z 4dB FORECAST PROTON EVENT 191300 MINOR PROTON EVENT IN PROGRESS.
24 SEPTEMBER 1977, POLCAP ABSORPTION 24/1400Z 2dB RIOMETER ABSORPTION, PROTON EVENT 24/1000Z MINOR PROTON EVENT IN PROGRESS.

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Active Regions: No. of Flares: Total	M	X	Outstanding events	Forecasts: Date	Location Lat-Long	Desc*	Alert Situations
244	1	31	38	83	05	N24E72	0	0	0		1	N24E72	Q	SOLQUIET MAGQUIET
						S30W07	0	0	0			S30W07	Q	
						S25W64	0	0	0			S25W64	Q	
245	2	01	36	82	04	N26E61	0	0	0		2	N26E61	Q	SOLQUIET MAGQUIET
						N28W50	0	0	0			N28W50	Q	
						N18E36	0	0	0			N18E36	Q	
246	3	02	40	83	03	N25E46	0	0	0		3	N25E46	Q	SOLQUIET MAGQUIET
						N28W63	0	0	0			N28W63	Q	
						N15E19	0	0	0			N15E19	Q	
247	4	03	37	86	08	N25E34	0	0	0		4	N25E34	Q	SOLQUIET MAGQUIET
						N16E06	0	0	0			N16E06	Q	
248	5	04	40	83	07	N25E20	0	0	0		5	N25E20	Q	SOLQUIET MAGQUIET
						N16W08	0	0	0			N16W08	Q	
249	6	05	35	84	03	N25E06	1	0	0		6	N25E06	Q	SOLQUIET MAGQUIET
						N15W19	0	0	0			N15W19	Q	
250	7	06	44	84	06	N24W05	0	0	0		7	N24W05	Q	SOLQUIET MAGQUIET
						N15W32	0	0	0			N15W32	Q	
						N20E65	0	0	0			N20E65	Q	
251	8	07	32	88	04	N21E52	0	0	0	X-2 X-RAY EVENT	8	N21E52	Q	SOLALERT 08/12 MAGALERT 09/10
						N24W20	0	0	0	BEHIND THE NE LIMB		N24W20	Q	
						N16W49	0	0	0	NEAR NE12.		N16W49	Q	
252	9	08	39	90	07	N23W31	0	0	0		9	N23W31	Q	SOLALERT 09/12 MAGALERT 09/11
						N21E41	0	0	0			N21E41	Q	
						N08E81	2	0	0			N08E81	E	
253	10	09	33	94	12	N24W47	0	0	0	MAJOR FLARE 2B/X-2,	10	N24W47	Q	SOLALERT 10/XX MAGALERT 10/12
						N07E76	2	1	1	09/1646Z MAX. N10		N07E76	A	
										E80 1100 F.U. BURST				
										AT 2800 MHZ.				
254	11	10	59	98	15	N23W58	0	0	0		11	N23W58	Q	SOLALERT 11/XX MAGALERT 11/13
						N21E16	0	0	0			N21E16	Q	
						N09E62	0	0	0			N09E62	A	
						N17E58	0	0	0			N17E58	Q	
255	12	11	84	103	19	N21W73	0	0	0		12	N21W73	Q	SOLALERT MAGALERT
						N11E49	4	0	0			N11E49	E	
						N20E39	1	0	0			N20E39	Q	
256	13	12	98	106	07	N21W86	0	0	0		13	N21W86	Q	SOLALERT 13/XX MAGALERT 13/15
						N10E35	0	0	0			N10E35	E	
						N18E25	0	0	0			N18E25	Q	
257	14	13	96	112	27	N08E21	0	0	0		14	N08E21	E	SOLALERT 14/15 MAGALERT 14/16
						N17E11	0	0	0			N17E11	E	
258	15	14	89	117	10	N08E05	0	0	0		15	N08E05	E	SOLALERT 15/17 MAGALERT 15/16
						N16E02	0	0	0			N16E02	E	
259	16	15	60	119	12	N08W08	0	0	0		16	N08W08	E	SOLALERT 16/18 MAGALERT MINOR 16/17
						N16W16	0	0	0			N16W16	Q	
						N26W76	0	0	0			N26W76	Q	
260	17	16	65	119	06	N09W19	3	1	0		17	N09W19	A	SOLALERT 17/18 MAGALERT 17/20 PRESTO
						N17W28	0	0	0			N17W28	Q	PROTON ARRIVAL ALERT 17/16 2120
						N25E64	0	0	0			N25E64	Q	
261	18	17	90	119	14	N08W32	1	1	0		18	N08W32	E	MAGALERT 18/19 SOLALERT 18/23
						N17W41	0	0	0			N17W41	Q	
						N26E51	0	0	0			N26E51	Q	
						S26E67	0	0	0			S26E67	Q	
262	19	18	71	119	06	N06W45	5	1	0		19	N06W45	E	SOLALERT 19/21 MAGALERT 19/21
						N14W55	0	0	0			N14W55	Q	
						N27E38	0	0	0			N27E38	Q	
						S24E56	1	0	0			S24E56	Q	
263	20	19	74	104	19	N09W60	3	0	1	REGION 889 PRODUCED	20	N09W60	E	SOLALERT 20/21 MAGALERT 20/21
						N15W71	0	0	0	A 3B FLARE AT 19/		N15W71	Q	
						N26E23	0	0	0	1028Z. THE FLARE		N26E23	Q	
						S23E39	1	0	0	WAS X-2 AND PRO-		S23E39	E	
										DUCED A PCA.				
264	21	20	98	108	42	N09W74	4	1	0		21	N09W74	E	SOLALERT 21/22 MAGALERT 21/22
						N26E10	0	0	0			N26E10	Q	
						S23E28	2	0	0			S23E28	E	
						N03W14	0	0	0			N03W14	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

SEPTEMBER 1977

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
265	22	21	61	106	40	S23E13	0	0	0		22	S23E13	E	SOLALERT 22/23 MAGALERT MAJOR 22/23
						N07W89	5	0	0			N07W89	E	
						N25W01	0	0	0			N25W01	Q	
						N23W34	0	0	0			N23W34	Q	
266	23	22	67	102	30	S23W02	0	0	0		23	S23W02	E	SOLALERT 23 MAGALERT 23
						N23W52	0	0	0			N23W52	Q	
267	24	23	56	99	18	S23W13	1	0	0		24	S23W13	Q	SOLNIL MAGNIL
						N23W63	0	0	0			N23W63	Q	
						S21E66	0	0	0			S21E66	Q	
						N28W24	0	0	0			N28W24	Q	
268	25	24	67	100	15	S23W26	0	0	0		25	S23W26	Q	SOLQUIET MAGQUIET
						N23W79	0	0	0			N23W79	Q	
						S20E47	1	0	0			S20E47	Q	
						N27E08	0	0	0			N27E08	Q	
						S20E63	2	0	0			S20E63	Q	
269	26	25	98	98	09	S23W41	0	0	0		26	S23W41	Q	SOLALERT 26/28 MAGQUIET
						S20E43	0	0	0			S20E43	Q	
						N29W07	0	0	0			N29W07	Q	
						S18E52	0	0	0			S18E52	Q	
						N13E77	2	2	0			N13E77	E	
270	27	26	86	99	10	S24W52	2	0	0		27	S24W52	E	SOLALERT 27/28 MAGALERT 27/27
						N27W16	0	0	0			N27W16	Q	
						N14E61	3	1	0			N14E61	E	
						N34E66	0	0	0			N34E66	Q	
						S30E39	1	0	0			S30E39	Q	
271	28	27	57	100	27	S27W63	0	0	0		28	S27W63	Q	SOLNIL MAGNIL
						N27W31	0	0	0			N27W31	Q	
						N14E46	2	0	0			N14E46	Q	
						N33E51	0	0	0			N33E51	Q	
272	29	28	93	100	10	N13W34	2	0	0		29	N13W34	E	SOLQUIET MAGQUIET
						N32E42	0	0	0			N32E42	Q	
						N20E75	0	0	0			N20E75	Q	
						S21E70	0	0	0			S21E70	Q	
						S25W77	0	0	0			S25W77	Q	
						N25W43	0	0	0			N25W43	Q	
						N16W27	0	0	0			N16W27	Q	
273	30	29	82	99	04	N14E21	3	0	0		30	N14E21	Q	SOLQUIET MAGQUIET
						N17W39	0	0	0			N17W39	Q	
						S21E56	0	0	0			S21E56	Q	
						N21E64	0	0	0			N21E64	Q	
						S25E81	0	0	0			S25E81	Q	
274	01	30	77	97	05	N15E07	1	0	0		01	N15E07	Q	SOLQUIET MAGQUIET
						N17W52	0	0	0			N17W52	Q	
						S20E48	0	0	0			S20E48	Q	
						S21E51	0	0	0			S21E51	Q	
						S26W34	0	0	0			S26W34	Q	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

	1976 FINAL			1977 PROVISIONAL								
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	0	0	28	15	0	7	15	44	42	17	22
2	28	0	0	32	19	8	11	14	43	45	15	29
3	30	0	0	25	19	8	10	22	43	42	24	29
4	30	0	0	22	16	8	7	23	49	39	19	25
5	25	0	0	21	18	8	7	16	48	40	23	28
6	24	0	0	13	7	9	8	16	33	40	26	26
7	38	0	7	8	7	8	7	12	41	25	28	25
8	7	0	19	0	26	28	0	19	38	20	25	18
9	14	0	22	0	21	28	0	25	33	17	30	30
10	0	0	19	0	23	19	0	29	29	23	25	40
11	0	0	22	14	25	19	8	34	27	9	23	45
12	13	0	16	19	48	9	12	35	22	8	29	51
13	17	0	12	23	68	8	16	26	20	10	40	48
14	23	0	32	22	61	7	22	33	25	7	40	47
15	25	7	34	20	45	0	34	26	8	0	42	53
16	28	7	36	18	49	0	33	21	8	0	38	56
17	31	14	34	38	44	0	32	20	8	0	36	53
18	24	20	24	26	37	0	29	12	21	0	40	59
19	28	13	15	7	25	8	22	0	36	7	35	58
20	19	12	8	0	10	0	12	11	21	8	30	58
21	15	8	9	15	9	0	20	14	26	8	32	59
22	22	13	9	24	9	10	19	7	40	23	42	42
23	28	11	9	34	9	8	18	7	57	30	15	41
24	30	10	17	35	8	7	8	7	68	45	19	48
25	38	9	22	17	8	14	0	0	74	38	25	46
26	29	9	25	8	8	8	14	7	71	41	34	49
27	24	8	16	0	0	9	8	13	74	34	38	54
28	19	8	17	13	0	16	16	16	65	26	36	61
29	15	8	19	11		8	9	20	50	16	38	63
30	8	8	19	8		8	8	30	45	8	32	67
31	0		12	10		8		40		7	31	
MEAN	20.6	5.2	15.3	15.7	22.6	8.0	13.2	18.4	38.4	21.2	29.9	44.1

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

	1976			1977								
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74.6	70.9	70.2	73.8	81.7*	72.6	74.8	77.2	88.9	102.0	83.0*	83.1
2	73.9	69.1	71.6	76.5	82.1	75.4	76.3	78.5	90.9*	100.7	82.8	84.2
3	73.8	69.8	71.2	76.0	80.9	74.8	76.6	81.9	93.0*	97.4	82.3	87.2
4	73.1	69.9	71.3	75.5	78.7	76.9	76.8	81.4*	94.2	94.0	82.9*	84.2
5	74.8	70.9	70.1	74.3	77.8	77.6	75.5	79.6	90.2*	88.0*	86.4	85.6
6	74.7	69.7	70.1	72.4	75.2	77.6	76.1	78.5	90.6	90.2	88.2	84.9
7	74.5	69.5	69.7	71.4	74.6	77.2	75.5*	77.1*	92.0	85.2	86.9	89.3
8	74.6	69.3	70.8	69.6	78.6	81.6	74.3	77.9	91.9*	82.1	85.1	91.6
9	74.8	70.7	74.3	68.4	83.1	80.3	74.8	83.6	90.9	79.8	85.9	95.9
10	74.9	69.4	76.8	68.8	83.5	80.5	76.5	80.8	89.2*	76.9	87.2	99.8
11	73.7	70.5	76.3	71.2	84.6	78.9	79.2	80.8	87.2	76.2	87.6	104.6
12	73.3	70.8	76.6	74.9	86.9*	78.6	80.2	79.7	83.3	75.8	86.5	107.8
13	72.6	69.4	76.1	77.5	88.5	77.9	82.7	81.5	84.2	77.8	89.0	112.9
14	74.4	69.2	81.0	74.5	85.2	77.2	83.4	84.8	82.3	76.8	87.5	118.2
15	75.5	71.1	79.8	75.6	84.4	74.8	86.8	85.0	82.3	76.0	86.9	120.7
16	77.8	71.1	77.8	77.5	85.7	74.1	83.7	85.1	81.4	76.9	87.3	120.4
17	78.6	72.8	75.5	76.1	89.6*	74.1	83.6	84.1	82.4	76.5	87.1	120.6
18	77.3	75.6	73.8	75.4	86.5	73.9	80.8	82.8	84.3	76.9	88.6	120.5
19	76.6*	74.6*	72.9	76.9	82.8	74.8	79.8*	82.1	85.2	76.9	87.8	104.5
20	75.8	72.9	71.7	75.2	81.1	72.3	80.4*	81.3	88.9	80.1	88.7	100.8
21	73.5	73.2	71.8	74.8	78.6	72.8	80.8	81.4	92.4	81.7	90.8	104.9*
22	75.4	73.3	73.4	76.8	75.9	74.6	80.1	82.9	98.8*	83.1	89.6	102.4
23	80.1	72.5	73.7	78.7	75.9	74.7	77.5	82.4	99.4	85.0	86.0	99.3
24	80.1	72.9	74.2	77.4	74.2	74.8	76.5	79.2	107.4	84.8	86.8	108.6
25	84.7	72.7	75.6	74.9	74.3	74.8	75.4	77.4	113.8	86.8	87.7	98.8
26	80.4	72.1	75.6	76.8	72.3	75.1	75.4	76.8	120.7	86.8	86.4	99.4
27	77.4	73.7	75.2	75.3	72.8	74.5	74.9	77.9	115.9*	85.4	85.4	100.8
28	73.8	71.7	74.5	77.1	72.6	74.4	74.2	79.1	113.4	87.5	82.4	100.8
29	72.1	69.7	74.8	76.1		75.4	74.8	81.7	111.9	86.7	86.1	99.4
30	72.1	69.7	75.1	76.3		74.6	76.6	89.9	106.9	84.1	85.5	97.7
31	78.4		76.4	79.6		74.1		92.8		80.4	84.7	
MEAN	75.4	71.3	74.3	74.9	80.3	75.8	78.2	81.4	94.5	83.7	86.4	100.9

* adjusted for burst

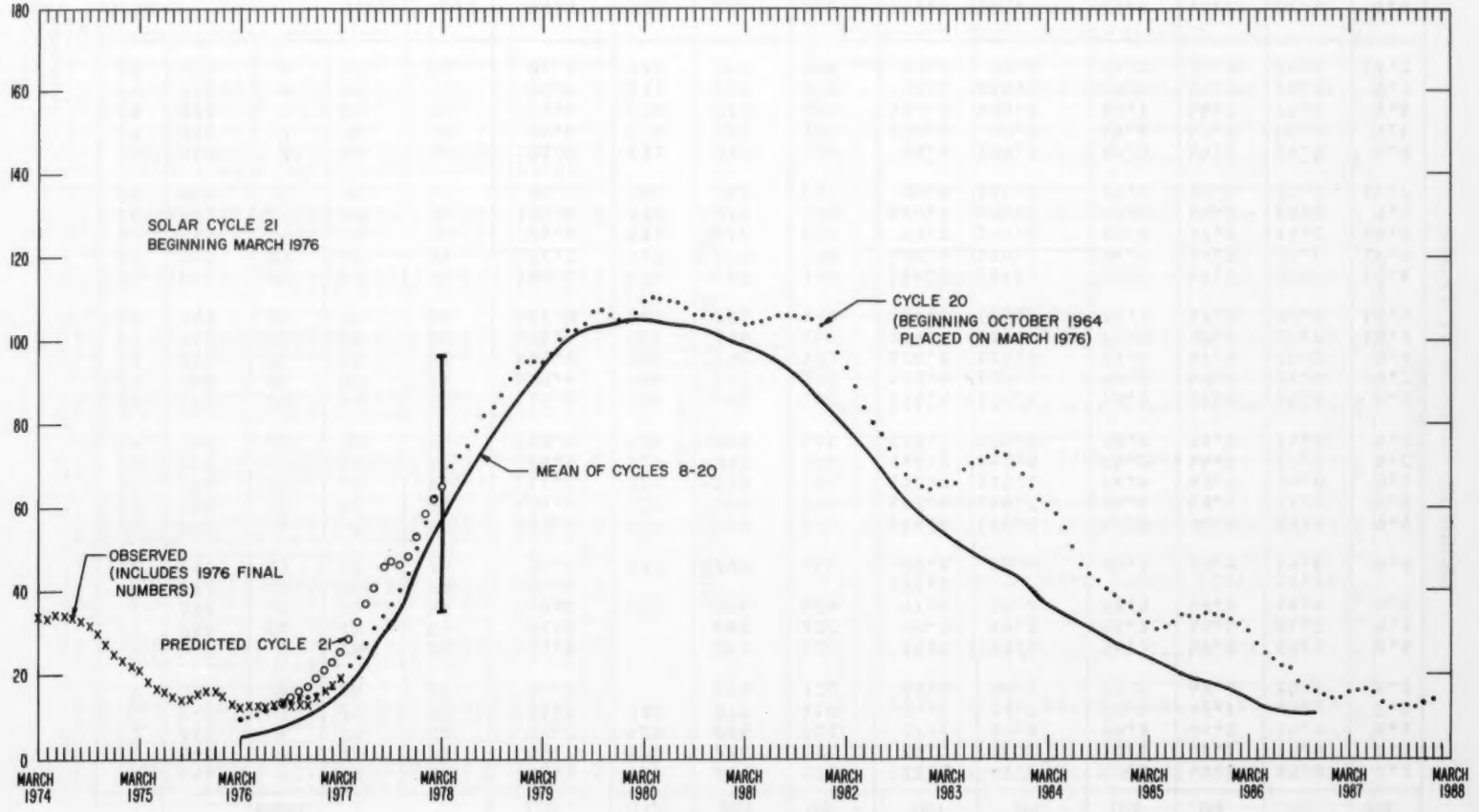
DAILY SOLAR INDICES

SEPTEMBER 1977

SEP 1977	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	244	4	22	17	81.6	522	274	121	83.1	82.8	52.1	40.8	19.8	8.3
2	245	5	29	25	82.7	523	276	121	84.2	81.1	53.1	40.1	18.9	7.8
3	246	6	29	30	85.7	525	279	123	87.2	89.8	55.8	44.3	16.9	8.1
4	247	7	25	26	82.8	532	277	119	84.2	83.7	53.5	40.7	18.1	7.9
5	248	8	20	25	84.3		274	121	85.6	84.7	55.8	42.3	20.5	8.3
6	249	9	26	21	83.6		273	121	84.9	83.9	54.3	42.5	19.1	8.6
7	250	10	25	24	88.0		282	122	89.3	89.0	55.7	44.4	21.2	9.3
8	251	11	18	19	90.2	531	284	129	91.6	96.2	59.0	48.4	16.8	9.3
9	252	12	30	26	94.6				95.9					
10	253	13	40	36	98.4	535	297	141	99.8	96.6	66.1	46.5	19.0	8.8
11	254	14	45	48	103.3	544	309	151	104.6	105.6	65.2	46.8	23.3	9.9
12	255	15	51	54	106.4	537	305	154	107.8	110.7	66.6	49.4	23.6	9.8
13	256	16	48	54	111.5	529	303	151	112.9	115.1	74.6	49.5	24.8	9.1
14	257	17	47	50	116.7	527	302	156	118.2	119.6	74.2	44.5	27.0	9.2
15	258	18	53	54	119.4	538	303	161	120.7	124.0	72.8	50.2	24.9	8.5
16	259	19	56	52	119.1	547	302	160	120.4	126.7	78.2	50.4	24.8	9.2
17	260	20	53	56	119.4	540	295	155	120.6	125.1	76.0	49.0	21.6	8.7
18	261	21	59	61	119.4	532	292	153	120.5	120.9	73.9	47.9	25.2	9.4
19	262	22	58	60	103.6	531	294	146	104.5	104.6	72.5	47.8	27.7	10.3
20	263	23	58	60	107.9	530	290	142	108.8	105.5	71.1	47.5	22.9	11.4
21	264	24	59	54	104.1*	529	285	138	104.9*	107.1	71.1	48.9	22.6	10.8
22	265	25	42	39	101.7	527	289	135	102.4	108.1	64.6	48.5	25.1	17.5
23	266	26	41	35	98.6	531	282	132	99.3	104.2	65.6	47.8	25.2	10.0
24	267	27	48	34	100.0	530	281	133	100.6	105.0	67.6	46.0	20.4	9.5
25	268	1	46	43	98.3	524	282	132	98.8	104.6	65.4	46.4	24.1	11.7
26	269	2	49	49	98.9	531	282	134	99.4	105.3	67.9	46.1	24.5	9.0
27	270	3	54	49	99.6	534	286	137	100.0	99.3	65.1	47.3	26.6	9.1
28	271	4	61	50	99.6	538	289	137	100.0	100.3	63.1	46.7	28.2	9.6
29	272	5	63	56	99.1	531	285	138	99.4	100.4	65.4	44.7	26.3	9.9
30	273	6	67	51	97.4	532	284	135	97.7	98.2	61.5	45.8	24.8	10.2
MEAN			44.1	41.9	99.9	532	288	138	100.9	102.7	65.1	46.2	22.9	9.6

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.



PREDICTED AND OBSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	14.7
1977	16.6	17.9	19.8	22.5	25.7	29.1	32.5	36.0	39.5	43.6	48.0	52.5
				(1)	(3)	(5)	(7)	(10)	(13)	(17)	(19)	(22)
1978	57.0	62.0	66.6	70.3	73.7	76.8	80.1	84.0	88.7	92.6	96.2	99.6
	(25)	(28)	(31)	(34)	(37)	(40)	(41)	(40)	(40)	(40)	(41)	(42)
1979	102.5	105.0	108.1	111.5	114.0	115.5	116.4	116.8	116.7	116.4	116.2	116.5
	(42)	(43)	(45)	(46)	(47)	(49)	(51)	(54)	(55)	(56)	(55)	(54)
1980	116.9	116.5	115.0	113.6	112.4	111.9	111.5	110.9	110.6	110.6	109.9	108.3
	(55)	(56)	(56)	(56)	(56)	(55)	(55)	(55)	(56)	(58)	(57)	(55)
1981	106.4	105.3	104.2	103.5	103.1	102.5	101.6	100.0	97.9	95.4	92.7	90.3
	(54)	(53)	(51)	(49)	(48)	(46)	(46)	(43)	(41)	(40)	(39)	(38)
1982	88.5	86.4	84.0	80.9	77.5	74.7	71.6	69.2	66.3	63.2	61.0	59.6
	(36)	(34)	(33)	(32)	(30)	(28)	(25)	(23)	(23)	(22)	(21)	(21)
1983	58.1	56.5	54.6	53.2	52.0	50.6	49.3	48.1	47.2	46.1	44.7	42.6
	(21)	(21)	(22)	(23)	(24)	(26)	(27)	(28)	(29)	(29)	(28)	(27)
1984	40.1	38.0	36.7	35.6	34.1	32.8	31.7	30.7	29.4	28.2	27.1	26.1
	(27)	(28)	(30)	(30)	(30)	(29)	(27)	(26)	(26)	(26)	(25)	(25)
1985	25.4	24.6	23.7	22.7	21.8	21.0	20.1	19.1	18.4	18.2	17.8	17.1
	(25)	(24)	(23)	(22)	(21)	(21)	(22)	(23)	(23)	(23)	(23)	(22)
1986	16.1	15.1	14.2	13.3	12.6	12.1	11.8	11.6	11.4	11.2	11.3	11.7
	(21)	(20)	(19)	(18)	(17)	(16)	(15)	(14)	(12)	(11)	(11)	(11)
1987	12.2	12.9	13.6	14.3	15.1							
	(11)	(12)	(13)	(14)	(15)							

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1976.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 20. Tests indicate that earlier cycles are from a different statistical population.

The table above assumes March 1976 as the minimum of solar cycle 20. The Office of Telecommunications is preparing similar predictions, using June 1976 as the observed minimum. Until the 1977 Zürich final relative sunspot numbers are available, either March or June 1976 is possible as the observed sunspot minimum.

Hα SOLAR FLARES

SEPTEMBER 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		CORD.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MITK	01	0407	0410	0415	S25	W67	.917		27.1	8	SN		C	0410	120		
CATA	01	0655	0655	0700	N24	E71	.968		6.6	5	SN	2		0655	56		
MONT	01	0736	0756	0821	N26	E69	.963		6.5	45	SN		C	0756	180		
CATA	01	0830	0830	0830	N29	E68	.963	14930	6.5		1N	2		0830	73		
MONT	01	0833	0857	0903	N26	E69	.963		6.5	30	SN		C	0857	80		E
MONT	01	0917	0923	0931	N26	E68	.959		6.5	14	SF		C	0923	60		E
CATA	01	1335	1340	1400	N24	E60	.913		6.1	25	SF	2		1340	67	1.4	
BUCA	02	0618		0622	N26	E62	.929		6.9	4	SF		C	0618	64	1.4	CD
MCMA	03	1452	1454	1458	N23	E35	.709	14930	6.2	6	SN		C	1454	20	.3	D
MCMA	03	1503	1514	1537	S33	W44	.751	14924	31.3	34	SN		C	1514	60	.9	E
MCMA	03	1515		1611	N27	E38	.763	14930	6.5	56	SF		C	1530	100	1.4	EFM
PALE	05	2103	2104	2124	N23	E 8	.505		6.5	21	SF	3	C		43		DE F
MONT	06	0848	0856	0923	N25	E07	.530		6.9	35	SF		C	0856	60		E
MITK	07	0220	0222	0238D	N22	E70	.962		12.3	18D	SN		C	0222	50		E
MCMA	07	1629E		1637	N21	E46	.795	14940	11.1	8D	SN		P	1629	20	.3	D
MCMA	07	1650E	1653	1705D	N20	E65	.934	14941	12.6	15D	SN		C	1653	25	.6	D
MONT	08	0652E	0708	1023D	N09	E90	1.000		15.0	211D	SF		C	0708	20		K
CATA	08	0825	0830	0830	N11	E90	1.000	14943	15.1	5	1F	1		0830	56		
CATA	08	0843	0843	0843	N10	E90	1.000	14943	15.1		1F	1		0843	56		
CATA	08	1340	1345	1345	N10	E90	1.000	14943	15.3	5	1F	1		1345	67		
MCMA	08	1444	1450	1457	N07	E90	1.000	14943	15.4	13	SF		C	1450			
MCMA	08	1516	1517	1521	N07	E90	1.000	14943	15.4	5	SF		C	1517			
MCMA	08	1640E		1720D	N07	E90	1.000	14943	15.4	40D	SF		C				
MCMA	08	1825E		1840D	N07	E90	1.000	14943	15.5	15D	SF		C				
MONT	09	0831E	0859	0953D	N08	E85	.997		15.7	82D	SN		C	0859	70		
CATA	09	0855	0855	0920	N12	E84	.997	14943	15.7	25	1N	1		0855	112		
CATA	09	1020	1025	1030	N09	E79	.985	14943	15.4	10	1B	1		1025	84		
MCMA	09	1609	1620	1630D	N07	E85	.997	14943	16.0	21D	SN		C	1620			E
MCMA	09	1630		1900D	N07	E87	.999	14943	16.2	150D	2B		C	1645			FIRU
MONT	10	0732E	0747	0849	N06	E69	.939		15.5	77D	SN		C	0747	50		D
MONT	10	0801	0804	0808	N27	W48	.838		6.7	7	SF		C	0804	20		D
MCMA	10	1418E		1451D	N05	E66	.919	14943	15.5	33D	SN		P	1439	25	.6	D
CATA	11	0855	0855	0900	N18	E50	.817		15.1	5	SB	1		0855	22	.4	
MCMA	11	1201E		1300D	N15	E47	.778	14942	15.0	59D	SN		P	1221	125	1.9	E
MCMA	11	1201E		1400	N07	E52	.804	14943	15.4	119D	SF		P	1215	60	1.0	E
MCMA	11	1300	1320	1338D	N15	E46	.768	14942	15.0	38D	SN		C	1320	130	1.9	E
MCMA	11	1338	1350	1412D	N15	E48	.788	14942	15.2	34D	SN		C	1350	60	.9	E
MCMA	11	1413	1420	1510	N15	E48	.788	14942	15.2	57	SB		C	1420	100	1.6	E
MCMA	11	1615	1619	1624	N27	W68	.959	14930	6.6	9	SB		C	1619	30	.7	D
MCMA	11	1710	1712	1718	N15	E47	.778	14942	15.2	8	SN		C	1712	30	.5	D
MCMA	11	1718	1721	1724	N15	E44	.747	14942	15.0	6	SN		C	1721	50	.7	E
RAMY	11	1849E	1851U	1856D	N 9	E48	.767		15.4	7D	SN	3	C		95		R
PALE	11	1850	1850	1907	N 9	E50	.788		15.5	17	SN	3	C		91		DE
MCMA	11	1850	1851	1855	N07	E46	.739	14943	15.2	5	SB		C	1851	40	.6	D
MONT	12	0954	1001	1008	N18	E47	.790		15.9	14	SF		C	1001	40		E
MONT	12	1007	1014	1029	N22	E42	.762		15.6	22	SF		C	1014	20		D
CATA	12	1015	1015	1015	N22	E42	.762		15.6		SN	1		1015	28	.4	
CATA	13	1455	1455	1510	N08	E21	.424		15.2	15	SB	2		1455	28	.3	
MCMA	14	1527	1555	1640	N05	E07	.221	14943	15.2	73	SN		C	1555	60	.6	E
MEND	14	1545		1619	N06	E07	.236	14943	15.2	34	1N		P		400		
MONT	15	0729	0731	0743	N15	W12	.404		14.4	14	SF		C	0731	20		D
MONT	15	0751	0803	0835	N08	W01	.236		15.3	44	SF		C	0803	20		D
MONT	15	1042	1051	1115D	N08	E01	.236		15.5	33D	SF		C	1051	80		
PALE	15	1855	1857	1901	N 7	W 3	.225		15.6	6	SF	3	C		36		DE
PALE	16	0245	0247	0253	N16	W29	.586		13.9	8	SF	3	C		73		U F
CATA	16	0645	0645	0650	N17	W11	.423		15.5	5	SN	2		0645	56	.6	H
RAMY	16	1735E	1739	1753	N 7	W20	.400		15.2	18D	SN	4	C		190		FDE
PALE	16	1803	1805	1830	N 7	W16	.347		15.6	27	SF	3	V		53		DE

Hα SOLAR FLARES

SEPTEMBER 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY			COORD.	TYPE	TIME — UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
PALE	16	1803	1805	1830	N 7	W16	.347		15.6	27	SF	3	C		53		DE
PALE	16	2140E	2307	0215	N 7	W21	.414	14942	15.3	275D	2B	3	V		826		Z U
MITK	16	2306E		2505D	N06	W20	.392	14943	15.5	119D	2N		P	2312	570	6.2	R
MITK	17	0241	0247	0300	N17	W28	.583		15.0	19	SN		C	0247	90	1.1	E
PALE	17	0245	0247	0253	N16	W29	.586		14.9	8	SF	3	C		73		U F
CATA	17	0630	0635	0655	N17	W38	.692		14.4	25	SB	2		0635	56	.7	
CATA	17	1020	1020	1030	N09	W31	.561		15.1	10	SN	2		1020	112	1.3	
MCMA	17	1345E	1400	1420D	N08	W33	.582	14943	15.1	35D	SB		C	1400	100	1.3	E
MCMA	17	1504E	1510	1523D	N18	W36	.676	14942	14.9	19D	SN		C	1510	60	.8	E
MCMA	17	1514		1528D	N08	W33	.582	14943	15.2	14D	SN		C	1523	150	1.5	E
PALE	17	2140E	2307	0215	N 7	W21	.413	14942	16.3	275D	2B	4	C		190		Z U
PALE	17	2152	2158	2234	N 7	W32	.563		15.5	42	SF	3	C		70		FDE
PALE	18	0019	0035	0054D	N 7	W33	.576	14942	15.5	35D	1B	3	V		368		Z F
PALE	18	0321	0325	0338	N 1	W35	.581		15.5	17	SF	3	V		120		FDE
RAMY	18	1228E	1230	1235D	S25	E61	.879		23.1	7D	SN	4	C		32		DE
TEHR	18	1258	1301	1311	N10	W45	.736		15.2	13	SF	3	C		127		
RAMY	18	1300E	1303	1308D	N 7	W37	.629		15.8	8D	SF	4	C		127		FDE
PALE	18	1906	1911	1929	N 8	W44	.718		15.5	23	SF	3	C		70		F
PALE	19	0004	0012	0042	N 8	W47	.752		15.5	38	SF	3	V		71		FDE
PALE	19	0004	0012	0042	N 8	W47	.752		15.5	38	SN	3	C		71		FDE
CATA	19	0955	1045	1125	N05	W57	.847	14943	15.1	90	3B	2		1045	843	15.8	
RAMY	19	1028E	1038	1208D	N 8	W58	.860	14943	15.1	100D	3B	3	C		71		Z F
RAMY	19	1351E	1359U	1409D	N 8	W57	.852		15.3	18D	SN	4	C		127		FDE
RAMY	19	1534E	1538	1555D	S23	E46	.740		23.1	21D	SN	4	C		95		FDE
PALE	20	0024E	0029	0037	S24	E40	.679		23.0	13D	SF	2	V		25		DE
MITK	20	0302		0315D	N12	W55	.842	14943	16.0	13D	1N		C	0315	210	3.7	F
MITK	20	0429E		0650D	N11	W57	.857	14943	15.9	141D	2N		C	0429	480	8.6	F
CATA	20	0605	0615	0650	N08	W60	.877	14943	15.8	45	1B	2		0615	224	4.6	
MONT	20	0714E	0714	0847	N07	W62	.892		15.7	93D	1N		C	0714	250		B
MONT	20	0849	0850	0853	S25	E33	.606		22.8	4	SF		C	0850	20		D
PALE	20	1753	1755	1801	N 8	W70	.946		15.5	8	SF	3	V		22		FDE
PALE	20	1838	1842	1850	N10	W71	.953		15.5	12	SN	3	V		60		FDE
PALE	20	2246	2250?	2313	S23	E27	.523		23.0	27	SF	3	V		27		DE
PALE	20	2308	2311	2326	N 8	W73	.961		15.5	18	SF	3	V		30		FDE
MITK	21	0345	0346	0348	N05	W77	.977		15.4	3	SF		C	0346	50		E
MONT	21	0804	0818	0830	N13	W81	.991		15.3	26	SF		C	0818	40		E
MONT	21	0821	0822	0826	N18	W88	1.000		14.7	5	SF		C	0822	20		D
MONT	21	0834	0837	0841	S24	E22	.475		23.0	7	SF		C	0837	40		D
MONT	21	0911	0933	1012D	N13	W82	.993		15.2	61D	SF		C	0933	40		E
MONT	21	1000	1002	1012D	N18	W89	1.000		14.7	12D	SF		C	1002	20		
CATA	21	1040	1040	1050	N09	W85	.997		15.1	10	SF	2		1040	28		
BUCA	22	0730		0800	S21	E11	.329	14952	23.1	30	1N		C	0731	214	2.5	C
WEND	22	1212		1236	S22	E09	.327	14952	23.2	24	1F		V		300		
TEHR	24	0446E	0449	0508	S20	E61	.876		28.8	22D	SF	4	C		127		
CATA	24	1100	1100	1100	N15	E90	1.000		1.2		SF	2		1100	28		
PALE	24	1943	1946	1950	S18	E69	.931		30.0	7	SF	3	C		29		DE
TEHR	25	0911	0922	1013	S21	W32	.574		23.0	62	SF	3	C		190		F R
TEHR	25	0911	0922	0928D	S21	W32	.574		23.0	17D	SF	3	V		190		F R
CATA	25	0920	0925	0935	S27	W24	.529	14952	23.6	15	1B	2		0925	224	3.1	
WEND	25	0925		1008	S22	W30	.556	14952	23.1	43	1N		P		400		
MCMA	25	1214E		1242	S28	W31	.609	14952	23.2	28D	SN		C	1216	75	.9	BHUU
MCMA	25	1237	1246	1255	N13	E88	1.000	14963	2.1	18	SF		C	1246			E
MCMA	25	1255	1300	1325	S28	W31	.609	14952	23.2	30	SN		C	1300	60	.7	E
MCMA	25	1316	1325	1340D	N28	E03	.543	14957	25.8	24D	SN		C	1325	50	.5	E
MCMA	25	1319	1321	1329	N13	E86	.999	14963	2.0	10	SN		C	1321			D
MCMA	25	1334	1349	1405D	N13	E84	.997	14963	1.9	31D	1B		C	1349			EX
RAMY	25	1339E	1350	1405D	N14	E82	.993	14963	1.7	26D	1B	3	C		0		F Z
RAMY	25	1658E	1701	1716	N14	E80	.989		1.7	18D	SB	3	C		0		DE
MCMA	25	1658E	1658	1702D	N12	E80	.988	14963	1.7	4D	SB		C	1658			D
PALE	25	1901	1902	1903	N28	W 2	.542		25.6	2	SF	3	V		40		FDE
PALE	26	0035E	0035U	0055D	N15	E76	.977		1.7	20D	SF	3	V		40		DE
MCMA	26	1423	1425	1455	S18	E42	.684	14962	29.7	32	SF		C	1425	20	.3	E
MCMA	26	1435	1445	1515	N28	W10	.560	14957	25.9	40	SN		C	1445	50	.5	E

Hα SOLAR FLARES

SEPTEMBER 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS'			REMARKS
	DATE SEP	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MCMA	26	1845E		1858	S21	E44	.716	14962	30.1	13D	SN		P	1845	25	.4	E
MCMA	26	1858	1902	1910	S27	W50	.794	14952	23.0	12	SN		C	1902	20	.4	DL
MCMA	26	1908	1912	1931D	S22	W52	.800	14952	22.9	23D	SB		C	1912	100	1.7	FKU
PALE	26	1909	1915	1926	S24	W48	.766		23.2	17	SF	3	V		145		U F
MCMA	26	1913		1931D	S28	W50	.797	14952	23.1	18D	SB		C	1920	80	1.3	
PALE	26	1934	1937	1944	S24	W48	.766		23.2	10	SF	3	V		73		U F
MITK	27	0517	0523	0538D	S21	E37	.636		30.0	21D	SF		C	0523	50	.7	EG
MONT	27	0845	0850	0854	S23	W57	.847		23.1	9	SN		C	0850	70		
MONT	27	0938	0940	0943	S23	W57	.847		23.1	5	SF		C	0940	20		D
MONT	27	1011	1017	1032	N14	E58	.870		1.8	21	SN		C	1017	60		E
MONT	27	1106	1118	1145D	N14	E58	.870		1.8	39D	SN		C	1118	60		
MONT	27	1108	1120	1145D	S25	W86	.995		21.0	37D	SF		C	1120	20		D
MCMA	27	1406	1422	1505	S21	E32	.575	14962	30.0	59	SN		C	1422	50	.6	E
MCMA	27	1537E		1602D	N14	E54	.836	14963	1.7	25D	SB		C	1548	40	.7	E
PALE	27	1822	1832	1850D	N15	E50	.801		1.5	28D	SN	3	C		44		FDE
PALE	27	2150	2155	2220	N15	E48	.782		1.5	30	SF	3	V		51		FDE
PALE	27	2150	2155	2220	N15	E48	.782		1.5	30	SF	3	C		51		FDE
PALE	27	2329E	0039	0120	N15	E47	.772		1.5	111D	SN	3	C		163		FDE
PALE	27	2329E	2349	0008	N15	E47	.772		1.5	39D	SF	3	V		113		FDE
PALE	28	0137	0139	0230	N15	E45	.751		1.4	53	SF	3	C		131		FDE
MONT	28	0810E	0815	0841	S23	W90	1.000		21.6	31D	SF		C	0815	20		D
CATA	28	0825	0825	0900	S22	W90	1.000		21.6	35	SF	2		0825	56		
CATA	28	1010	1015	1035	S21	W90	1.000		21.7	25	SF	2		1015	28		
MONT	28	1019E	1019	1033	S23	W90	1.000		21.7	14D	SF		C	1019	20		D
PALE	28	2329E	2349	0008	N15	E47	.771		2.5	39D	SF	3	V		113		FDE
PALE	28	2329E	2349	0006D	N15	E47	.771		2.5	37D	SF	3	C		113		FDE
PALE	29	0058	0102	0117	N15	E34	.627		1.6	19	SF	3	C		33		FDE
PALE	29	0206	0218	0220	N15	E33	.616		1.6	14	SF	3	C		41		FDE
TEHR	29	0623E	0627	0634	N16	E30	.588		1.5	11D	SN	3	C		159		F
BUCA	29	0702		0805	N14	E31	.585		1.6	63	SN		P	0710	107	1.3	
MONT	29	1114	1126	1146	N15	E31	.592		1.8	32	SF		C	1126	40		E
TEHR	30	0612	0619	0622D	N14	E20	.454		1.8	10D	SF	3	V		190		U F
MONT	30	0758	0800	0805	N16	W45	.754		27.0	7	SF		C	0800	20		D
MONT	30	1111	1117	1139	N16	E16	.434		1.7	28	SN		C	1117	80		E

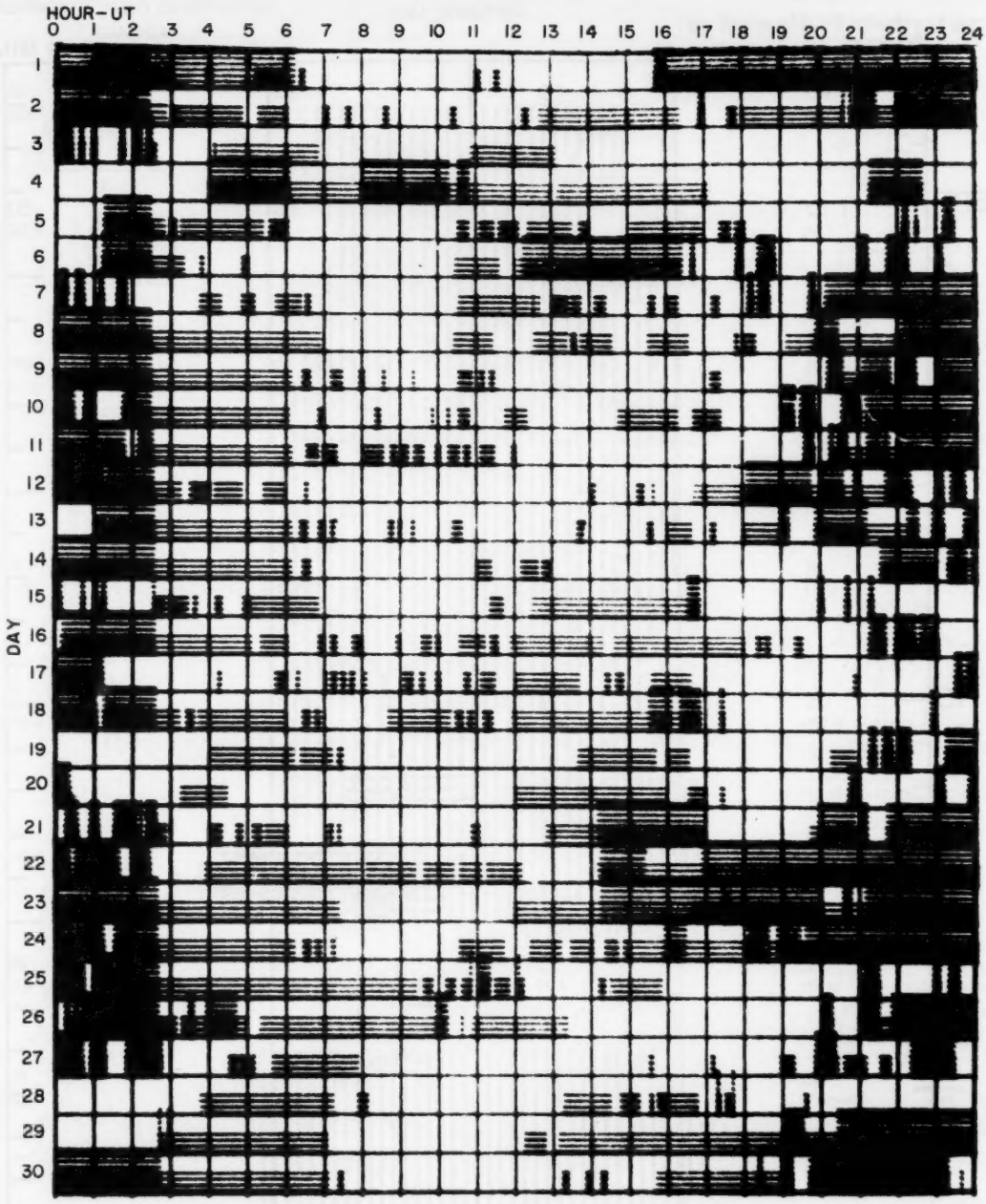
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

SEPTEMBER 1977



Observatories included in total patrol:

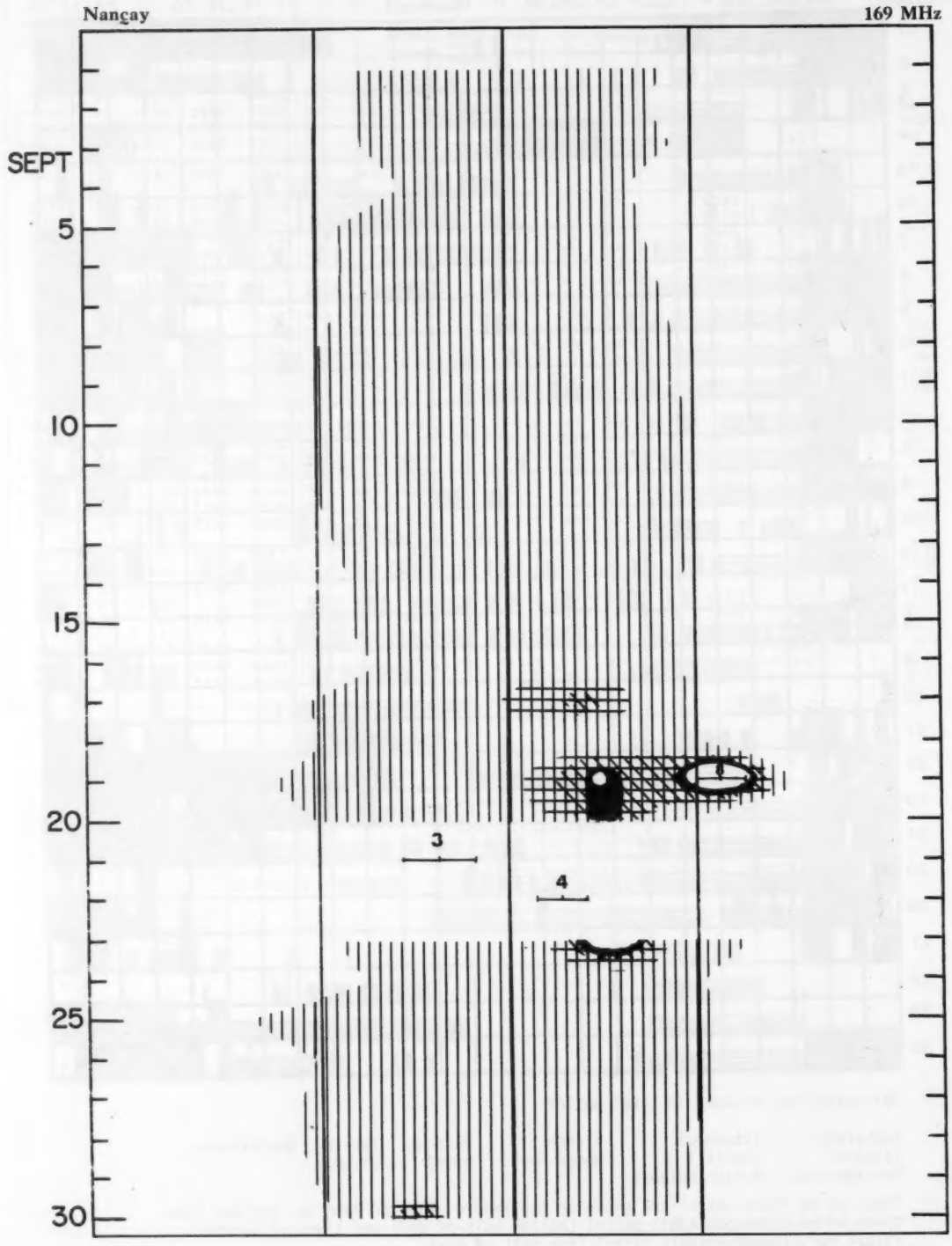
Bucharest	Istanboul	Mitaka	Palehua	Tehran	Wendelstein
Catania	Kandilli	Monte Mario	Ramey	Upice	
Herstmonceux	McMath-Hulbert				

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

14
Sep 77

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

SEPTEMBER 1977

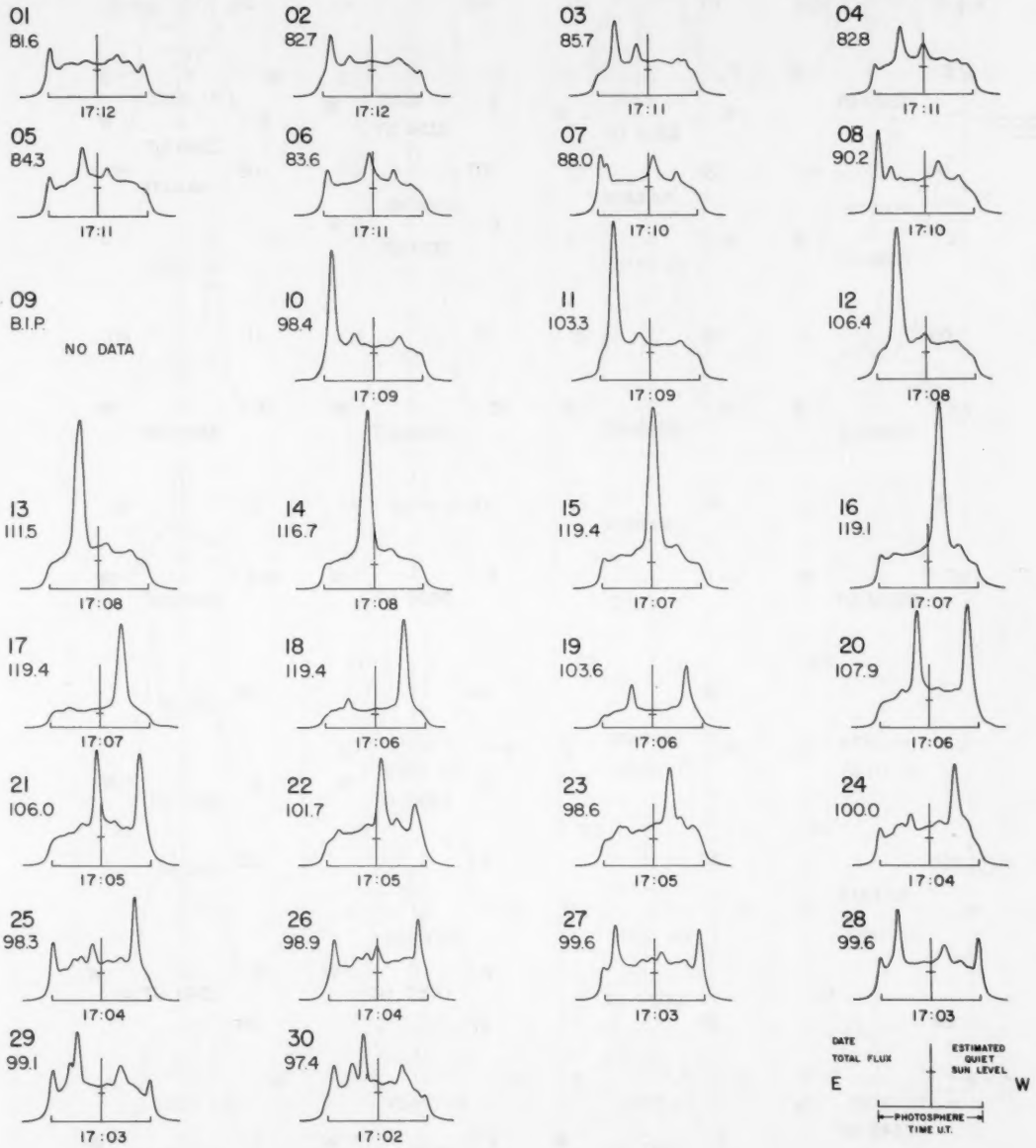


EAST-WEST SOLAR SCANS

SEPTEMBER 1977

ALGONQUIN RADIO OBSERVATORY
CANADA

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution



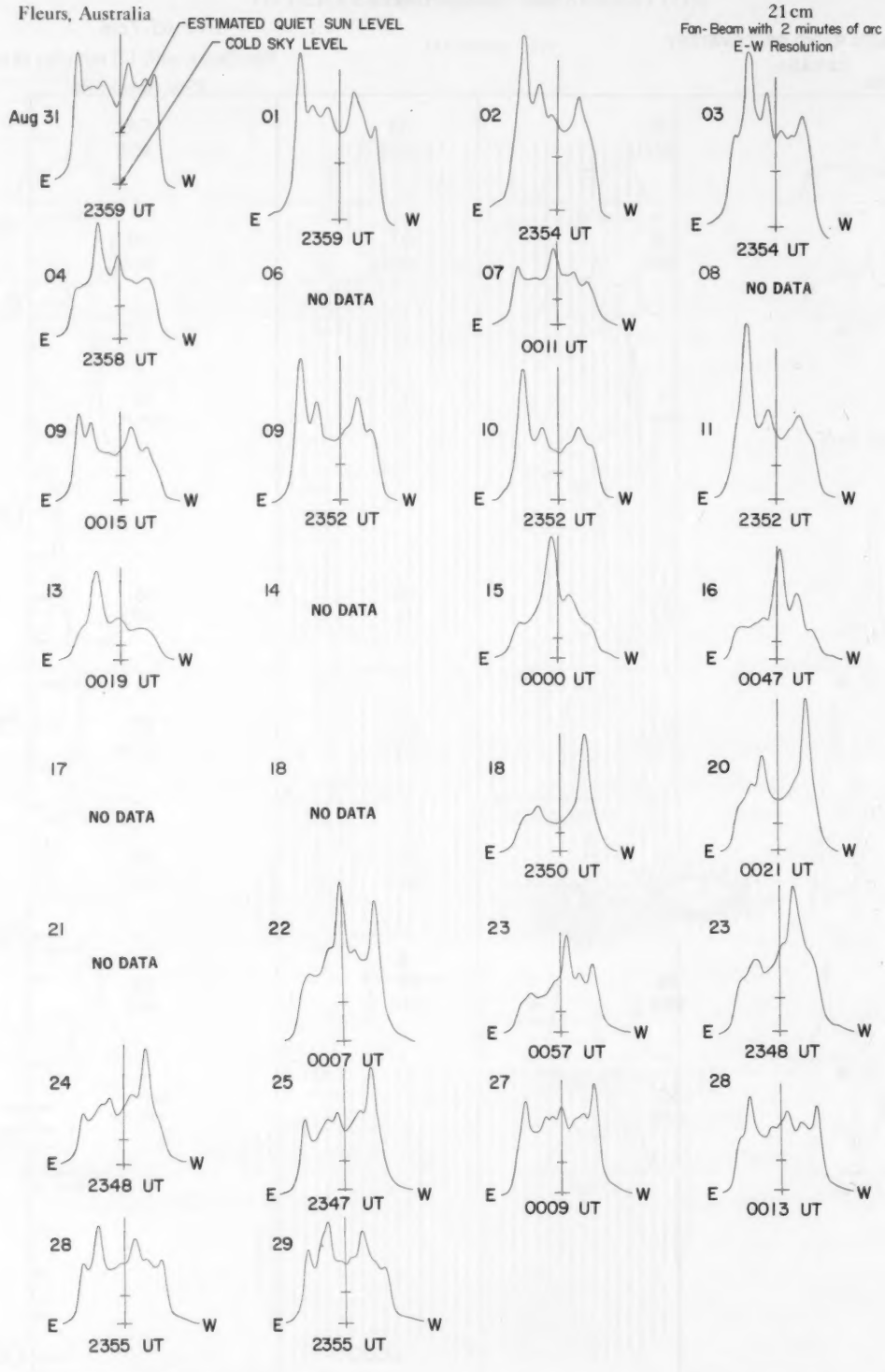
16
Sep 77

EAST-WEST SOLAR SCANS

SEPTEMBER 1977

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

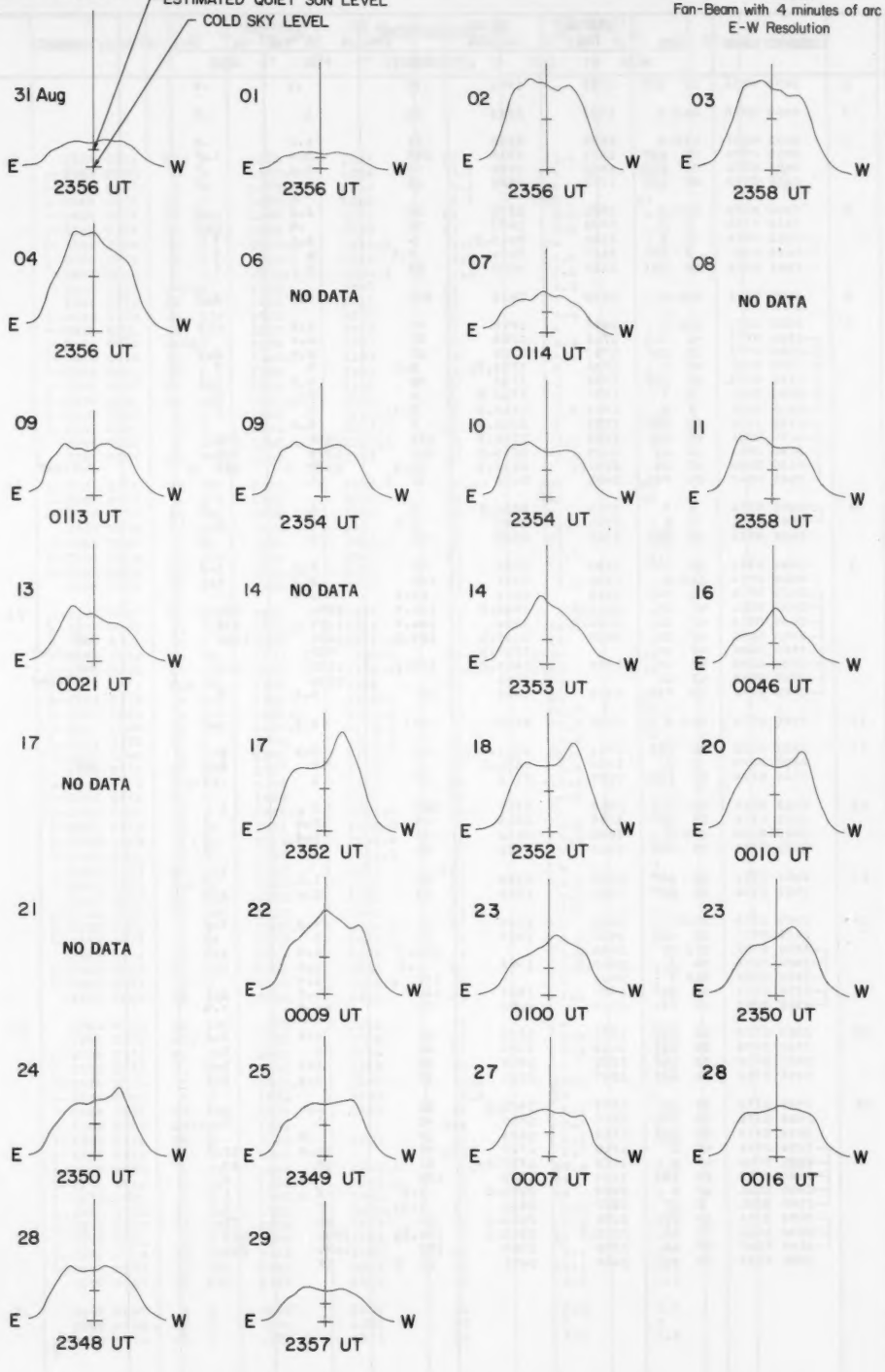
SEPTEMBER 1977

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
SEPTEMBER 1977

	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	REMARKS
1	2800	OTTA	20 GRF	1255	1543	195	.8	.4		
2	2800	OTTA	240 R	1920	2000	40	1	.5		
3	2695	PENT	240 R	0045	0055	18	1.2	.6		
	2800	OTTA	20 GRF	1420	1530	115	3.4	1.7		
	2800	OTTA	20 GRF	1630	1708	75	1.4	.7		
	2800	OTTA	20 GRF	1750	1800	25	1	.5		
5	2800	OTTA	240 R	1500	1550	50	1.2	.6		
	2800	OTTA	1 S	1630	1633	10	.6	.3		
	2800	OTTA	1 S	2101	2103.2	4	6.4	3		
	2695	BOUL	3 GRF	2102	2104	8.5	6	2		
	2800	OTTA	29 PBI	2105	2105	25	2	1		
6	2695	PENT	240 R	2030	2410	230	4.4	2.2		
7	2800	OTTA	240 R	1617	1710	53	1.6	.9		
	2800	OTTA	41 SER	1713	1720	37	6.4			
	2800	OTTA	22 GRF	1713	1720	15	6.4	2.9		
	2695	BOUL	45 C	1716	1720.5	8.5	5	2		
	2800	OTTA	22 GRF	1730	1732	20	3.8	1.5		
	2695	BOUL	1 S	1731	1732.5	4	2	1		
	2695	BOUL	1 S	1740.5	1742.5	2.5	2	1		
	2800	OTTA	28 PRE	2223	2226.5	5	5.8			
	2695	BOUL	49 GB	2225	2300.5	121	1636	246		
	2800	OTTA	47 GB	2228	2259.2	112	1370	363		
	8800	SGMR	47 GB	2232.6	2245.9	18.8	2079 U	623 U		2,5,SWF
	2695	PENT	29 PBI	2420	2420	90 D	16			
8	2800	OTTA	1 S	2201	2201.7	1	6	.3		
	2695	BOUL	8 S	2202	2205	1.5	5	2		
	2800	OTTA	20 GRF	2220	2230	40	1	.5		
9	2800	OTTA	20 GRF	1150	1207	42	2.6	1.3		
	2800	OTTA	240 R	1350	1535	105	2.8	1.4		
	2800	OTTA	28 PRE	1610	1615	15.5	3.4			
	2695	BOUL	47 GB	1622.5	1646.5	161.5	1098	191		
	2800	OTTA	47 GB	1625.5	1645	154.5	1100	333		
	8800	SGMR	47 GB	1633	1640.6	129.2	4580	1832		SWF
	8800	SGMR	47 GB		1717.3		952			2,4,CONT
	2695	SGMR	47 GB	1633	1645.2	129.2	1121	448		SWF
	2695	SGMR	47 GB		1718		1066			2,4,CONT
	2800	OTTA	29 PBI	1900	1900	165	8.6	3		
10	2800	OTTA	240 R	2125	2225	60	2.6	1.3		
11	2800	OTTA	20 GRF	1711	1714.5	60	2.6	1		
	8800	SGMR	3 S	1850	1851.3	2	23	6.9		SWF
	2800	OTTA	20 GRF	2125	2140	55	1	.5		
12	2800	OTTA	20 GRF	1310	1355	105	2	1		
	2800	OTTA	20 GRF	1500	1515	50	1.4	.7		
	2800	OTTA	240 R	1605	1640	35	1.8	.9		
	2800	OTTA	20 GRF	1915	1922	75	1.4	.7		
13	2800	OTTA	20 GRF	1230	1258	55	1.6	.8		
	2800	OTTA	20 GRF	1920	1940	80	2.4	1.2		
14	2800	OTTA	240FR	1150	1245	55	4.6	2.3		
	2800	OTTA	20 GRF	1417	1424	20	1	.5		
	2800	OTTA	27A RF	1446.5		243.5	1.8	1.5		
	2800	OTTA	24 R	1446.5	1448	1.5	1.8			
	2800	OTTA	24P R	1448		172	1.8			
	2800	OTTA	20 GRF	1523	1537	148	4.2	2.1		
	2800	OTTA	26 FAL	1740	1850	70	-1.8	-.9		
15	2800	OTTA	28 GRF	1215	1225	60	4.6	2.3		
	2800	OTTA	20 GRF	1440	1455	40	2	1		
	2800	OTTA	20 GRF	1755	1855	95	3.6	1.8		
	2800	OTTA	20 GRF	2015	2030	35	2.2	1.1		
16	2800	OTTA	28 GRF	1429	1430.2	25	1.4	.7		
	2800	OTTA	20 GRF	1515	1525	40	2	1		
	2800	OTTA	20 GRF	1610	1620	17	.8	.4		
	2800	OTTA	45 C	1710	1735	50	16.8	12.2		
	2695	BOUL	45 C	1720	1757.5	61	25	19		
	2800	OTTA	29 PBI	1800	1800	170	7.8	3		
	2695	BOUL	45 C	2023	2023.5	3.5	3	1		
	2695	BOUL	2 SF	2027	2028	1.5	3	1		
	2800	OTTA	28 PRE	2125	2158.6	55	44	28		
	2695	BOUL	49 GB	2126.5	2309.5	192.5D	1590	219		
	2695	PENT	47 GB	2220	2308	155	1480	248		
	2695	PENT	29 PBI	2455	2455	20 D	17			

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

SEPTEMBER 1977

	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	REMARKS
17	2800	OTTA	240 R	1220	1230	10	2.4	1.2		
	8800	SGMR	3 S	1252.5	1253	9.6	194	58.2		SWF
	2695	SGMR	3 S	1252.5	1253	5.6	24	7.2		SWF
	2800	OTTA	3 S	1252.5	1253	2.5	30	11		
	2800	OTTA	29 PBI	1255	1255	55	3.2	1.6		
	2800	OTTA	21 GRF	1458	1520	52	2.6	1.3		
	8800	SGMR	3 S	1514.4	1514.7	1.7	24	7.2		
	2800	OTTA	1 S	1514.5	1515	1.5	1.6	.8		
	2695	SGMR	1 S	1514.6	1514.8	1.1	2.4	.7		
	2800	OTTA	240AR	1845	1945	60	1.8			
	2800	OTTA	20 GRF	1855	1910	50	3	1.5		
	2800	OTTA	20 GRF	2020	2027	60	1.4	.7		
	2695	BOUL	22 GRF	2025	2033	12	4	1		
	2800	OTTA	240AR	2138	2222	42	1.8			
	2800	OTTA	22 GRF	2143.5	2153	35	4.4	2.4		
	2695	BOUL	45 C	2145	2153	24.5	5	2		
	2695	PENT	23 GRF	2223	2235	37	3	1.5		
	2695	BOUL	20 GRF	2227.5	2236	14	3	1		
	2695	PENT	1 S	2245	2246.5	5	3.2	1.2		
	2695	BOUL	3 S	2246	2247.5	11.5	5	2		
	2695	PENT	2 S/F	2305.1	2305.6	2	2.2	1		
	2695	PENT	28 PRE	2345	2353	33	2.2			
18	2695	BOUL	47 GB	0011	0031	26.5D	296	51		
	2695	PENT	4 S/F	0018	0030	35	380	65		
	2695	PENT	29 PBI	0046	0046	40 D	21			
	2800	OTTA	22 GRF	1800	1823	50	2.6	1.3		
	8800	SGMR	3 S	1904	1905.9	3	23	9.2		
	2800	OTTA	21 GRF	1904	1913	26	2.4	1.2		
	2800	OTTA	40 F	1904.5	1905	2	2			
	2800	OTTA	20 GRF	2122	2140	70	3.4	1.7		
19	2695	PENT	21 GRF	0008	0020	34	8.2	4.1		
	2695	PENT	4 S/F	0011.5	0012	6	16.8	5		
	2695	BOUL	8 S	0012	0012.5	3	16	5		
	8800	SGMR	47 GB	1031 E	1100.9	75.1D	1034	311		
	2695	SGMR	47 GB	1031 E	1100.6	75.1D	1133	400		
	2800	OTTA	26A FAL	1130	1300	90	-28			
	2800	OTTA	4 S/F	1206	1210.3	11	63	25		
	2695	SGMR	4 S/F	1206.4	1210.5	13	65.7	19.7		3
	8800	SGMR	4 S/F	1239.1	1239.3	3	75.5	22.7		3
	2800	OTTA	45 C	1240	1240.2	4	18.8	7.2		
	2695	SGMR	4 S/F	1240	1240.4	2.5	20.4	6.1		3
	2800	OTTA	22 GRF	1317	1320	23	1.4	.9		
	2800	OTTA	26A FAL	1342	1510	88	-16.8	-8.4		
	2800	OTTA	45 C	1400	1401	8	2.6	1.3		
	8800	SGMR	3 S	1500.9	1501.5	2.4	31	9.3		
	2800	OTTA	1 S	1501	1501.3	2	1.2	.3		
	2695	SGMR	1 S	1501.1	1501.4	1	9.6	2.9		
	2695	BOUL	8 S	1502	1502.5	1	7	2		
	2800	OTTA	22 GRF	1512	1610	120	4	2		
	2800	OTTA	240 R	1715	1726	11	1.8	.9		
	2800	OTTA	20 GRF	1728	1738	45	1.8	.9		
	2800	OTTA	21 GRF	1927	1943	28	3.4	2		
	2695	BOUL	3 S	1931.5	1934.5	28	4	1		
	2800	OTTA	1 S	1932	1934.2	8	4.4	2		
	2800	OTTA	20 GRF	2020	2030	50	1.8	.9		
	2800	OTTA	21 GRF	2135	2230	80	2.2	1.1		
	2800	OTTA	1 S	2139	2140.5	7	2	1		
	2695	PENT	20 GRF	2300	2310	30	1.6	.8		
20	2800	OTTA	22 GRF	1155	1210	50	4	2.2		
	2800	OTTA	240 R	1250	1310	20	2.4	1.2		
	2800	OTTA	20 GRF	1500	1504	40	2.8	1.4		
	2300	OTTA	21 GRF	1540	1610	95	1	.5		
	2800	OTTA	4 S/F	1631.5	1632.1	2.5	14.4	3.6		
	2695	BOUL	8 S	1632	1633	5.5	13	4		
	2800	OTTA	29 PBI	1634	1634	15	1.2	.6		
	2800	OTTA	27AFRF	1720		310	2.2	2		
	2800	OTTA	24 R	1720	1740	20	2.2	1.1		
	2800	OTTA	24P R	1740		253	2.2			
	2695	SGMR	4 S/F	1840	1840.6	1.7	19.8	7.9		CONT
	2800	OTTA	4 S/F	1840	1840.6	2	20	6		
	2695	BOUL	8 S	1840.5	1841	2	15	5		
	2800	OTTA	20 GRF	1909	1910.5	11	1.6	.8		
	2800	OTTA	20 GRF	2010	2015	20	1.8	.9		
	2695	BOUL	8 S	2045	2045.5	2	11	4		
	2800	OTTA	20 GRF	2100	2105	28	3.6	2		
	2695	PENT	26 FAL	2153	2240	37	-2.2	-1.1		
	2695	PENT	20 GRF	2320	2326	23	2.2	1.1		
21	2695	PENT	1 S	0000	0005	18	2.8	1.4		
	2800	OTTA	1 S	1156	1201	18	2	1		
	2800	OTTA	45 C	1534	1539	26	7.6	3.8		

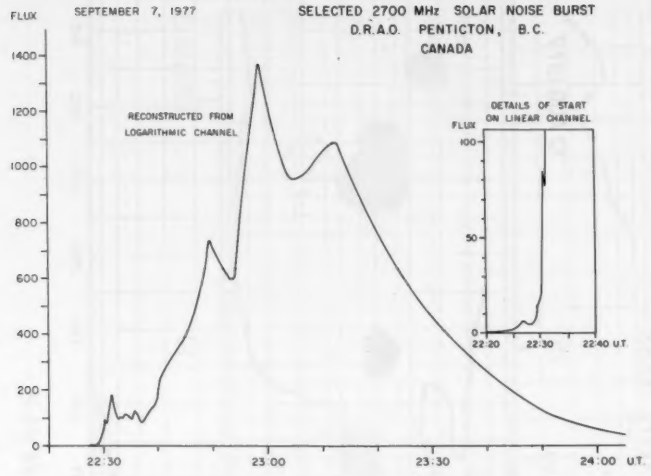
SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

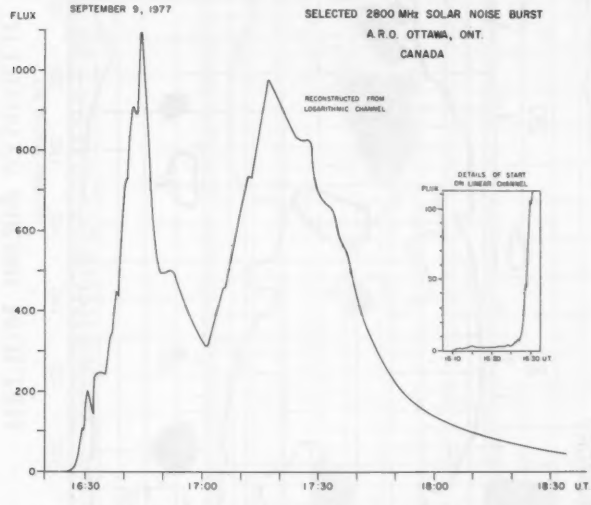
SEPTEMBER 1977

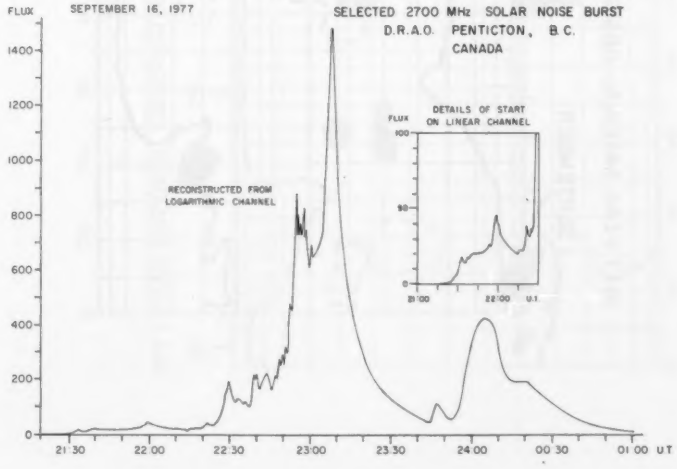
	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	2695	BOUL	45 C	1535.5	1547.5	27	13	4		
	2800	OTTA	30 PBI	1600	1600	80	3.8	1.9		
	2800	OTTA	20 GRF	1615	1623	30	3.4	1.5		
	2695	BOUL	45 C	1616.5	1623.5	19	4	1		
	2800	OTTA	1 S	1703	1703.8	2	4.2	2		
	2695	BOUL	23 GRF	1704	1704.5	7	4	1		
	2695	PENT	240 R	2130	2200	30	1.8	.9		
	2695	PENT	20 GRF	2249	2256	33	2.2	1.6		
	2695	BOUL	1 S	2256	2256.5	2.5	3	1		
22	2695	BOUL	45 C	1356	1401	6.5	6	2		
	2695	SGMR	2 S/F	1357	1400	6	6	1.8		CONT
	8800	SGMR	4 S/F	1359.2	1400.5	3.8	41.5	12.5		CONT
	2800	OTTA	27A RF	1726		31	1	.8		
	2800	OTTA	24 R	1726	1727	1	1	.5		
	2800	OTTA	24P R	1727		19	1			
	2800	OTTA	2 S/F	1728	1729.9	3.5	1.6	.8		
	2800	OTTA	2 S/F	1740	1742	6	1.2	.6		
	2800	OTTA	26 FAL	1746	1757	11	-1	-.5		
	2695	BOUL	40 F	1752	1753	8	10	3		
23	2800	OTTA	240 R	2120	2134	14	1.2	.6		
	2695	PENT	20 GRF	2340	2355	65	2.2	1.1		
25	2800	OTTA	240AR	1200	1210	10	1.8	.9		
	2800	OTTA	1 S	1206	1207	4	2	1		
	2800	OTTA	27A RF	1245		215	1.6	1.4		
	2800	OTTA	24 R	1245	1300	15	1.6	.8		
	2800	OTTA	24P R	1300		165	1.6			
	2800	OTTA	8 S	1312	1312.1	.6	4.8	2.4		
	2695	SGMR	3 S	1333.6	1344.3	27.6	35.3	18.6		SWF
	8800	SGMR	3 S	1334.9	1344.3	26.2	63.2	19		SWF
	2800	OTTA	4 S/F	1340	1344.2	8	34	14		
	2695	BOUL	3 S	1344.5	1345.5	3	17	6		
	2800	OTTA	29 PBI	1348	1348	42	5.4			
	2800	OTTA	26 FAL	1545	1620	35	-1.6	-.8		
	8800	SGMR	3 S	1654.7	1656.5	4.7	30	9		SWF
	2695	SGMR	1 S	1656.6	1657.9	3.7	1.8	.6		SWF
	2800	OTTA	1 S	1657	1658	2	2.6	1.3		
	2695	BOUL	1 S	1658	1658.5	1.5	1			
	2800	OTTA	1 S	1855	1856	2	.8	.4		
	2800	OTTA	20 GRF	1900	1930	100	1.6	.8		
26	2800	OTTA	4 S/F	1908	1910	6	19	6.4		
	2695	SGMR	3 S	1908.6U	1910.2U	5.7U	21.4U	6.4U		S
	2695	BOUL	3 S	1909	1911	6.5	17	6		
	2800	OTTA	29 PBI	1914	1914	18	2.6	1.4		
	2695	BOUL	45 C	2158.5	2204	6.5	189	42		
27	2800	OTTA	20 GRF	1515	1532.1	100	2	.6		
	2800	OTTA	20 GRF	1715		120	1	.7		
28	2800	OTTA	20 GRF	1500	1540	105	1.2	.8		
	2800	OTTA	20 GRF	1819	1820	13	1	.5		
29	2695	BOUL	45 C	2028.5	2031.5	5	18	6		
30	2800	OTTA	20 GRF	2115	2137	40	1.4	.9		
	2695	PENT	20 GRF	2224	2226.8	18	1.4			

SELECTED SOLAR NOISE BURSTS

7 - 16 SEPTEMBER 1977



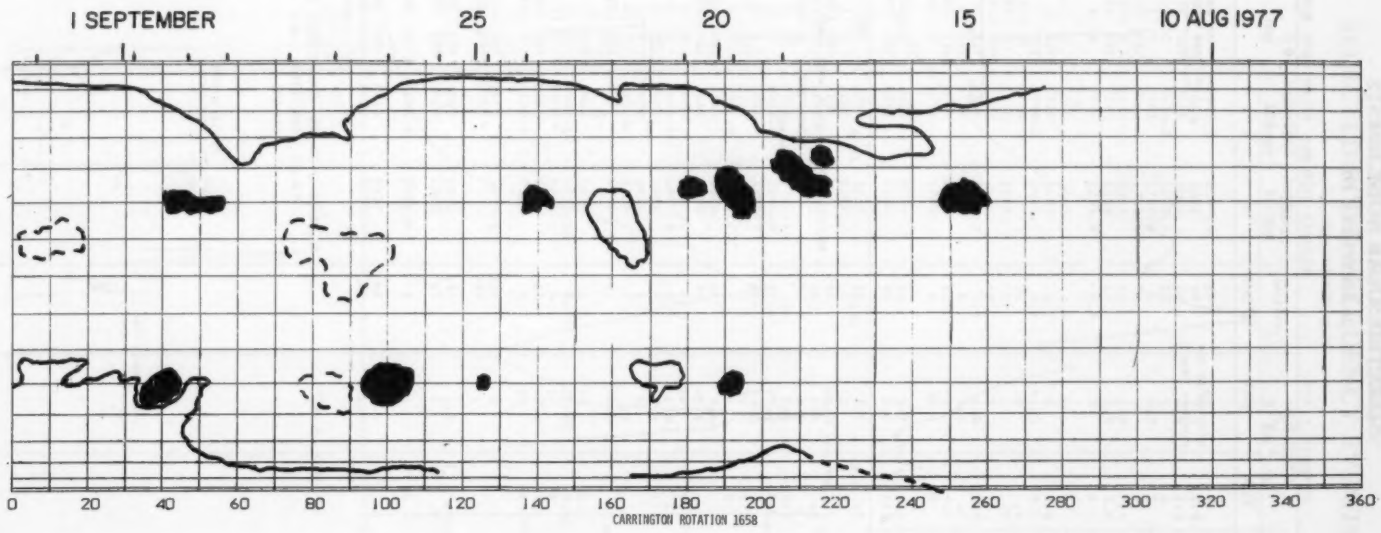




HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1658

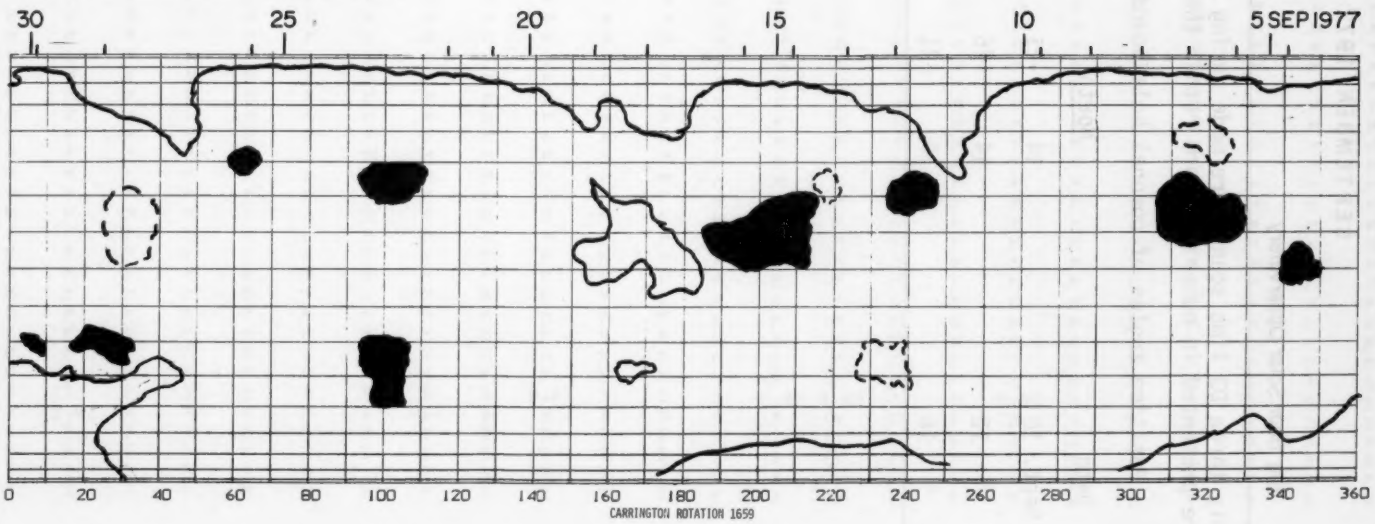
KITT PEAK NATIONAL OBSERVATORY



HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1659

KITT PEAK NATIONAL OBSERVATORY



23
Sep 77

CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

SEPTEMBER 1977

Big Bear Solar Observatory

Only three D3 limb scans were made during September. These data are presented in numerical form rather than graphically.

Position angles of coronal hole boundaries (in degrees)

Date	North		South	
Sept. 10	14	-21	-156	144
" 12	14	-26	-156	174
" 18	19	-21	-166	149

SOLAR X-RAYS BY SATELLITE
SMS GOES
SEPTEMBER 1977

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
9/ 1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B
9/25	B	B	B	B	M	M	B	B	B	0.02	B	B	B	0.06	0.02	B	B	0.02	B	B	B	B	B	B	B
9/26	B	0.03	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/27	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/28	B	B	B	B	M	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/29	B	B	B	B	M	M	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/30	B	B	B	B	M	M	B	M	B	B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
SEPTEMBER 1977

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
9/ 1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/ 9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9/24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	B	B	B	B
9/25	B	B	B	0.01	M	M	B	B	0.03	0.05	0.01	B	B	0.04	0.03	B	B	0.02	B	0.02	B	B	B	B	B
9/26	0.01	0.03	0.02	B	M	M	B	B	0.02	B	B	B	B	B	B	B	B	B	B	0.01	3.49	1.36	B	B	0.11
9/27	B	B	B	B	M	M	0.01	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/28	B	B	B	B	M	M	0.01	B	B	0.02	B	B	B	B	B	B	B	B	B	B	B	3	B	B	B
9/29	B	B	B	B	M	M	0.03	0.01	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
9/30	B	B	B	B	M	M	0.32	M	0.14	B	M	B	B	B	B	B	B	B	B	B	B	B	B	B	0.01

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR WIND

Interplanetary Scintillations

SEPTEMBER 1977

UCSD 74 MHZ SCINTILLATIONS

DAY	3C48 VEL	ERR	3C144 VEL	ERR	3C147 VEL	ERR	3C161 VEL	ERR	3C237 VEL	ERR	3C273 VEL	ERR	3C298 VEL	ERR	3C459 VEL	ERR
1			346	5			320	*			243	15	278	*		
1													382	*		
2	330	*					408	10								
3			285	22			314	70			202	29				
4	284	4	363	27			388	6			211	56	290	4		
5	304	*	384	10												
6	308	34	328	72												
7	613	*														
8			433	43									501	16		
9	293	*	336	0												
10	351	*														
11	310	*											464	41		
12	378	82					383	24					422	24		
13	377	18	413	20			392	39					408	*		
14	473	36					432	9	341	*						
15	269	*	315	6			333	64								
16			445	34									375	30		
17			454	3			343	4					484	18		
18	413	3	491	5			421	37								
19	331	76	384	28			657	45					383	106		
20	496	55	477	16			425	11					442	11		
21	449	15	514	15			618	16	525	14			425	26		
22	415	0	670	9												
23	464	11	494	80			334	30	522	60						
24	512	19	425	20												
25									602	112						
26			412	39					418	76						
27	469	38	481	108					362	21			397	17		
28	457	12	358	22			327	88	332	11			345	90		
29	422	30					453	85								
30			565	36					305	9			276	35		

SEPTEMBER 5	UT	LAT	DIST	DLON
3C48	11.	12.	1.20	11.
3C144	15.	6.	0.99	17.
3C147	14.	14.	0.98	16.
3C161	16.	-3.	0.94	18.
3C237	20.	-14.	0.23	74.
3C273	22.	14.	0.38	-68.
3C298	24.	21.	0.76	-39.
3C459	8.	9.	1.30	2.

15	UT	LAT	DIST	DLON
3C48	10.	12.	1.23	9.
3C144	14.	6.	1.04	17.
3C147	13.	14.	1.03	16.
3C161	16.	-1.	0.98	15.
3C237	19.	-6.	0.38	66.
3C273	21.	23.	0.23	-79.
3C298	23.	28.	0.65	-47.
3C459	8.	9.	1.30	-0.

25	UT	LAT	DIST	DLON
3C48	10.	11.	1.25	7.
3C144	14.	5.	1.09	16.
3C147	13.	13.	1.07	15.
3C161	15.	-2.	1.02	14.
3C237	18.	-3.	0.53	57.
3C273	20.	64.	0.10	-92.
3C298	22.	36.	0.54	-54.
3C459	7.	8.	1.29	-3.

*indicates data for which no error estimate is available since only two antennas were operating.

3C298 was observed at 0 hr. UT on September 1st and at 23 hr. UT after September 1st.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1950	MAR 7	▒	▒	▒	▒	▒	▒	▒	-	▒	TA	A*	▒	TA	▒	▒	▒	▒	▒	*	▒	*	▒	AT	▒	▒	▒	T*	▒	▒	▒	▒	-	TA	▒	▒
1951	APR 3	▒	▒	▒	▒	▒	▒	▒	*	▒	▒	▒	*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
1952	APR 30	▒	AT	▒	▒	▒	▒	TA	▒	AT	T*	▒	▒	-	▒	▒	▒	▒	▒	A*	▒	TA	AT	AT	▒	▒	▒	A*	▒	▒	▒	▒	-	▒	▒	▒
1953	MAY 27	▒	-	▒	▒	▒	▒	*	TA	▒	▒	▒	▒	▒	▒	-	*	▒	▒	-	▒	▒	▒	▒	T*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
1954	JUN 23	▒	▒	▒	▒	▒	AT	▒	▒	AT	▒	TA	T*	AT	▒	▒	TA	A*	▒	▒	▒	▒	AT	A*	TA	AT	AT	▒	▒	▒	▒	A*	▒	▒	▒	▒
1955	JUL 20	▒	▒	T*	▒	▒	▒	▒	▒	▒	TA	A*	▒	▒	▒	▒	▒	▒	▒	AT	T*	TA	TA	TA	-	TA	TA	▒	▒	▒	▒	▒	▒	▒	▒	▒
1956	AUG 16	▒	▒	▒	▒	▒	▒	TA	T*	▒	▒	▒	▒	▒	▒	*	▒	AT	▒	▒	▒	-	AT	-	AT	-	AT	-	TA	-	-	-	▒	-	▒	-
1957	SEP 12	▒	-	▒	-	AT	-	▒	-	▒	▒	-	▒	AT	-	AT	-	▒	AT	-	▒	-	▒	▒	AT	▒	▒	-	▒	▒	▒	▒	▒	▒	▒	▒
1958	OCT 9	AT	*	▒	A*	▒	▒	▒	▒	▒	TA	▒	A*	▒	▒	*	▒	▒	▒	▒	TA	▒	AT	▒	AT	▒	▒	-	▒	▒	▒	AT	▒	▒	▒	▒
1959	NOV 5	▒	AT	TA	▒	▒	▒	T*	▒	▒	AT	*	▒	-	▒	*	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	*	▒	▒	▒	▒	▒	▒	▒	▒
1960	DEC 2	▒	▒	▒	▒	▒	▒	TA	▒	▒	*	▒	▒	▒	▒	AT	▒	▒	*	▒	▒	▒	▒	-	*	▒	▒	▒	▒	-	TA	-	▒	▒	▒	▒
1961	DEC 29	.	-	AT	-	▒	*	▒	AT	▒	▒	▒	▒	*	▒	*	A*	▒	▒	*	▒	*	▒	▒	*	▒	▒	▒	▒	▒	▒	▒	▒	AT	▒	▒
1962	1977 JAN 25	▒	▒	▒	▒	-	▒	▒	-	TA	-	▒	A*	▒	▒	AT	-	▒	▒	▒	▒	*	▒	-	▒	▒	TA	▒	▒	▒	▒	▒	▒	▒	▒	▒
1963	FEB 21	AT	▒	-	▒	-	▒	-	TA	▒	▒	*	▒	▒	▒	▒	▒	▒	▒	▒	▒	-	▒	▒	-	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
1964	MAR 20	▒	▒	TA	▒	AT	▒	▒	▒	*	▒	▒	▒	-	▒	▒	▒	▒	▒	▒	A*	▒	▒	▒	-	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
1965	APR 16	▒	▒	▒	TA	▒	▒	TA	-	AT	TA	▒	▒	▒	▒	▒	-	TA	▒	▒	AT	AT	▒	▒	▒	TA	▒	▒	▒	▒	▒	▒	▒	AT	▒	▒
1966	MAY 13	TA	▒	-	▒	-	▒	TA	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	AT	▒	-	-	AT	T*	-	T*	▒	▒	▒	▒	▒	AT	AT	-	▒
1967	JUN 9	▒	▒	▒	▒	▒	▒	▒	TA	▒	-	▒	▒	TA	▒	▒	▒	▒	▒	AT	A*	▒	▒	▒	▒	AT	*	A*	▒	▒	TA	TA	▒	▒	▒	▒
1968	JUL 6	▒	▒	▒	▒	▒	▒	▒	▒	▒	A*	▒	▒	T*	TA	TA	▒	T*	▒	▒	AT	▒	▒	▒	-	AT	▒	▒	-	▒	▒	▒	▒	▒	▒	▒
1969	AUG 2	▒	TA	▒	▒	▒	▒	▒	TA	-	▒	▒	TA	*	▒	▒	▒	▒	▒	▒	▒	▒	AT	TA	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒
1970	AUG 29	▒	▒	-	▒	-	▒	TA	▒	▒	▒	▒	▒	▒	▒	▒	▒	AT	AT	▒	▒	▒	AT	▒	TA	▒	TA	-	AT	▒	AT	▒	▒	▒	▒	▒
1971	SEP 25	▒	▒	▒	▒	▒	-	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒	▒

▒ = definitely towards the sun □ = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.

Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

the Danish Meteorological Institute is used for the second half of the day.
Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.
Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1951	MAR 29																											
1952	APR 25																											
1953	MAY 22																											
1954	JUN 18																											
1955	JUL 15																											
1956	AUG 11																											
1957	SEP 7																											
1958	OCT 4																											
1959	OCT 31																											
1960	NOV 27																											
1961	DEC 24																											
1962	1977 JAN 20																											
1963	FEB 16																											
1964	MAR 15																											
1965	APR 11																											
1966	MAY 8																											
1967	JUN 4																											
1968	JUL 1																											
1969	JUL 28																											
1970	AUG 24																											
1971	SEP 20																											

POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT.
Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

STANFORD MEAN SOLAR MAGNETIC FIELD (MICROTESLA)

	1976			1977								
	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.
DAY												
01	.	-2	-4	.	5	2	-7	-13	13	2	-16	-9
02	.	-3	-2	.	0	0	-17	-6	15	-12	-23	-13
03	-1	-4	5	4	-6	-2	-16	-5	15	-18	-25	.
04	1	1	13	15	-8	-9	-12	1	13	-26	-23	3
05	7	1	21	.	-11	-17	-9	7	0	-31	-16	12
06	-5	7	23	3	-17	-22	-4	11	-19	-33	-5	18
07	0	16	25	-7	-12	-20	0	7	-32	-26	-1	22
08	2	25	18	-14	.	-13	5	-5	-31	-14	11	17
09	6	23	13	-9	.	-9	8	.	.	-7	25	8
10	13	12	8	-11	.	-3	2	-22	0	3	20	4
11	19	.	-3	-8	21	3	-4	.	7	20	17	6
12	21	9	-4	.	19	11	-7	-29	17	29	12	13
13	24	.	-7	.	13	18	-14	-20	28	30	11	19
14	29	4	-1	8	11	3	-8	-5	38	24	5	23
15	22	-2	0	6	9	.	-8	4	40	26	7	40
16	19	-4	0	9	-3	-9	-11	12	31	18	.	.
17	14	-3	6	6	-12	-12	-9	20	24	13	5	38
18	5	.	3	3	-13	-13	1	29	18	4	13	41
19	-1	0	8	0	-20	-15	13	27	19	1	19	31
20	-9	.	6	-4	.	-12	18	19	16	-1	23	17
21	-5	11	5	.	.	-7	21	12	10	6	24	2
22	-1	9	1	-14	3	2	13	.	2	9	22	-3
23	6	2	-10	-12	7	.	17	1	-2	22	18	-2
24	12	5	-10	-12	12	15	9	-1	-7	25	8	-6
25	14	-5	-14	-7	13	13	6	4	-15	31	4	-1
26	20	0	-16	-6	11	13	9	-10	-10	30	0	-3
27	8	-6	-16	0	9	10	7	-10	4	24	2	-8
28	9	-5	-10	6	5	8	2	-10	15	6	-2	.
29	9	-12	-5	8		4	-10	-4	19	4	-6	-8
30	4	-8	.	7		7	-11	3	14	-4	-6	3
31	-4		11	7		6		6		-10	-11	

Solar Proton Event (Provisional) September 1977

Date/Time (UT)	Remarks
09/0900	Start of absorption on Thule Polar Cap 30 MHz riometer.
1600	30 MHz absorption at Thule reached 0.3 dB (daytime). It remained near this value until 09/2400.
10/0900 to 1900	Thule absorption (30 MHz) ranged from 0.2 to 0.3 dB.
11/0300	Thule 30 MHz riometer recovered to normal level.
16/2330	Proton flux increase detected by SMS-2 40-500 MeV detector.
17/0030	Proton flux increase detected by SMS-2 18-38 MeV detector.
0100	Proton flux increase detected by SMS-2 6-10 MeV detector.
0300	SMS-2 Proton fluxes 2.6 [Protons/(cm^2-sec-sterad-MeV)] at 8 MeV 0.48 [Protons/(cm^2-sec-sterad-MeV)] at 28 MeV 5.1 [Protons/(cm^{2}sec-sterad)] 40-500 MeV
0430	SMS-2 Proton fluxes 6.52 [Protons/(cm^2-sec-sterad-MeV)] at 8 MeV 0.08 [Protons/(cm^2-sec-sterad-MeV)] at 28 MeV 3.3 [Protons/(cm^2-sec-sterad)] 40-500 MeV
1500	Proton flux near background on 40-500 MeV channel.
1530	Proton flux near background at 28 MeV.
1900	Proton flux slightly enhanced at 8 MeV.
19/1145	Absorption started on Thule 30 MHz riometer.
1248	NOAA 5 Satellite fluxes >60 MeV >30 MeV 20 27 [protons/(cm^2-sec-sterad)]
1327	NOAA 5 Satellite fluxes >60 MeV >30 MeV 17 32 [protons/(cm^2-sec-sterad)]
2130	Maximum absorption on Thule 30 MHz riometer was 4.5 dB.
2300	SMS-2 Satellite fluxes 27 [Protons/(cm^2-sec-sterad-MeV)] at 8 MeV 2.0 [Protons/(cm^2-sec-sterad-MeV)] at 28 MeV 24 [Protons/(cm^2-sec-sterad)] 40-500 MeV 0.050 [Protons/(cm^2-sec-sterad-MeV)] at 117 MeV
20/1200	SMS-2 Satellite fluxes 47 [Protons/(cm^2-sec-sterad-MeV)] at 8 MeV 1.9 [Protons/(cm^2-sec-sterad-MeV)] at 28 MeV 16 [Protons/(cm^2-sec-sterad)] 40-500 MeV 0.023 [Protons/(cm^2-sec-sterad-MeV)] at 117 MeV

Date/Time (UT)	Remarks
20/1845	NOAA 5 Satellite fluxes
	0.24 [Protons/(cm^2-sec-sterad)] >60 MeV
	5.6 [Protons/(cm^2-sec-sterad)] >30 MeV
	15 [Protons/(cm^2-sec-sterad)] >10 MeV
21/0000	2.2 [Protons/(cm^2-sec-sterad-Mev)] at 8 MeV
	0.22 [Protons/(cm^2-sec-sterad-MeV)] at 28 MeV
	1.6 [Protons/(cm^2-sec-sterad)] 40-500 MeV
	flux near background at 117 MeV
0200	Thule 30 MHz riometer absorption recovered to normal levels.

AUGUST 1977 DATA

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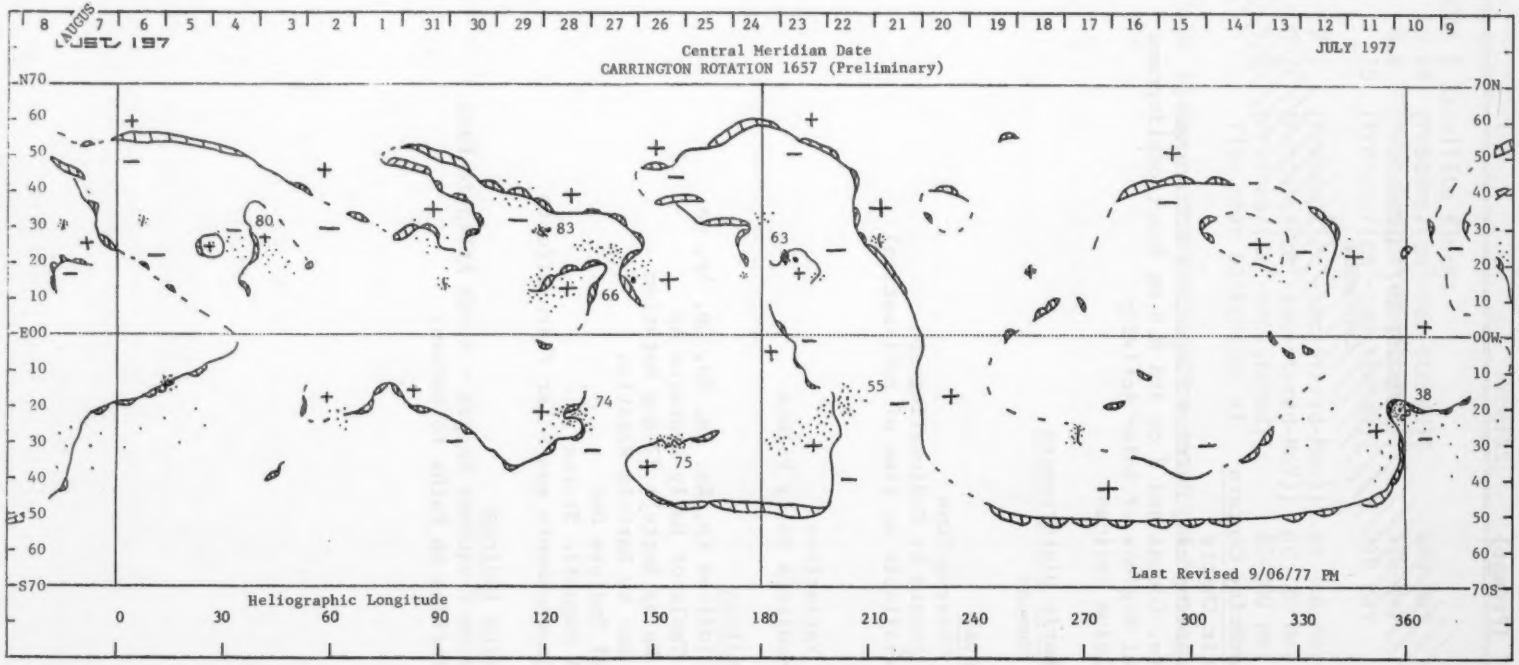
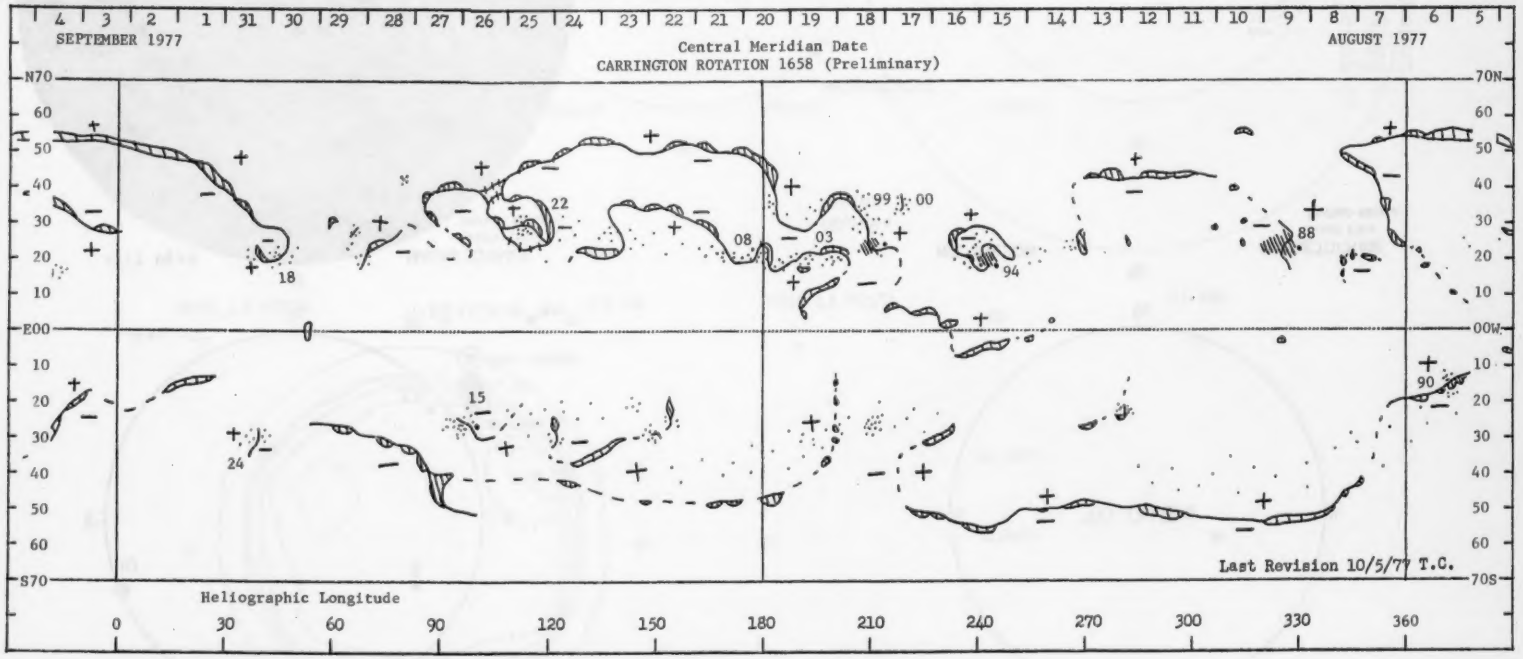
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1657 (PRELIMINARY)



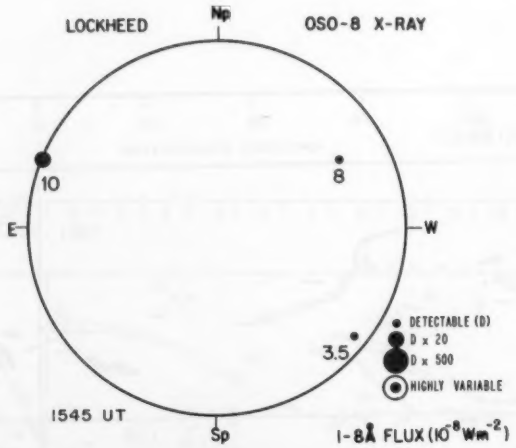
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1658 (PRELIMINARY)



AUGUST 1, 1977 (P = 10.79, B_o = 5.80, L_o = 78.92)

LOCKHEED OSO-8 X-RAY

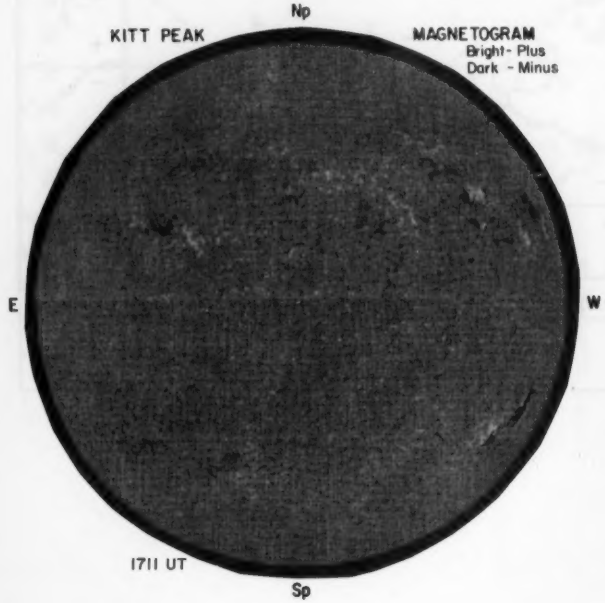


1545 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

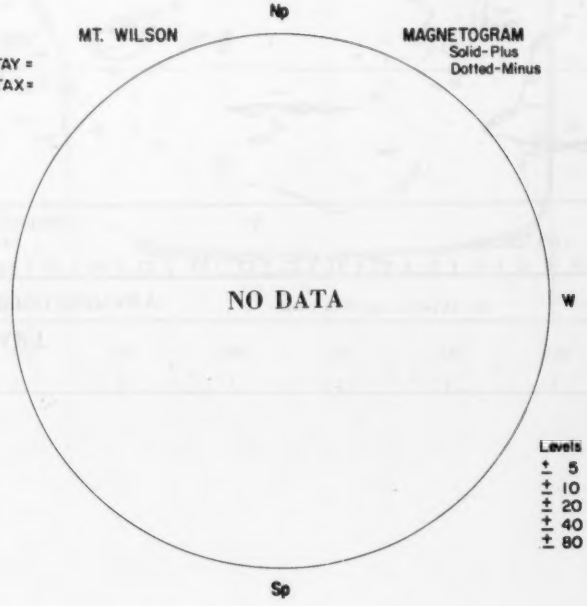
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1711 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



Sp

01

RAMEY AFB

Np

Hα

E

W

1146 UT

Sp

BOULDER

Np

SUNSPOTS

883

874

E

W

1500 UT

1436 UT

PROMINENCES

Sp

McMATH-HULBERT

Np

CALCIUM REPORT

872

876

883

884

880

886

866

874

E

W

1130 UT

Sp

FAIR	D
74 - 2300 - 3.0	
80 - 1000 - 2.5	
83 - 0800 - 3.5	
84 - 0300 - 2.5	

NOSC LA POSTA

2.0 CM

Np

E

W

Sp

1650 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

Np

NO DATA

CLOUDY

E

W

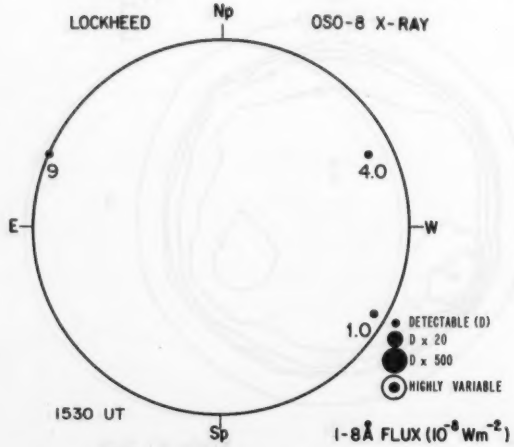
Sp

2009 UT

Ant. Temp. Unit 100°K

AUGUST 2, 1977 (P = 11.19, B_o = 5.87, L_o = 65.69)

LOCKHEED OSO-8 X-RAY



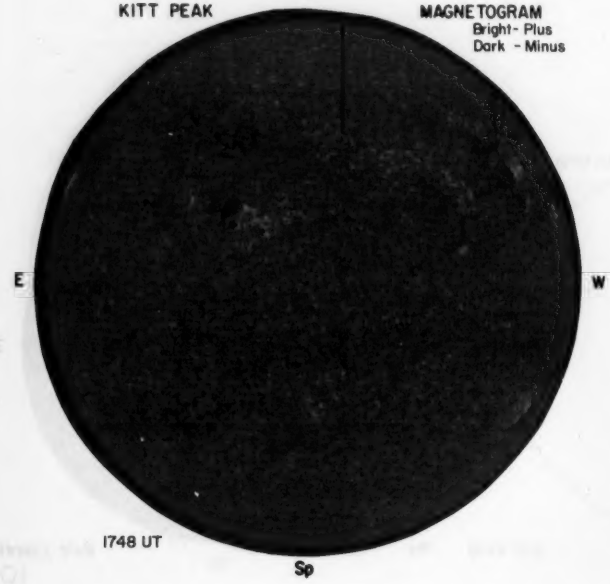
1530 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

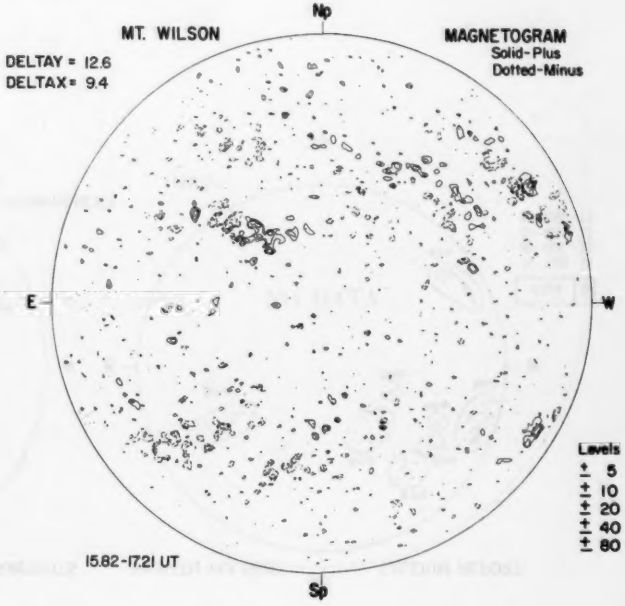
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1748 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

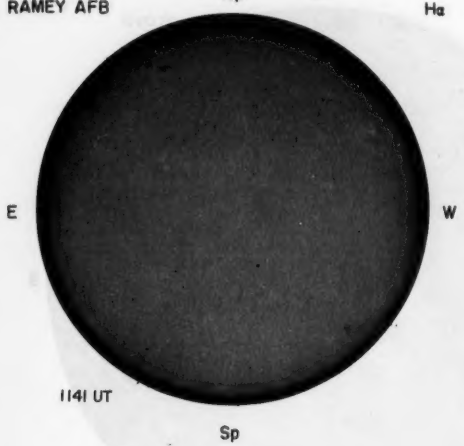
DELTAY = 12.6
DELTAX = 9.4



15.82-17.21 UT

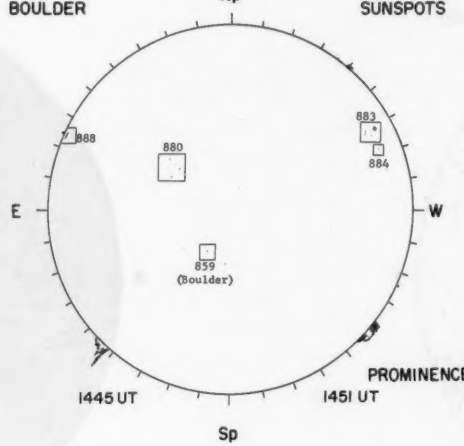
02

RAMEY AFB



1141 UT

Hα BOULDER



1445 UT

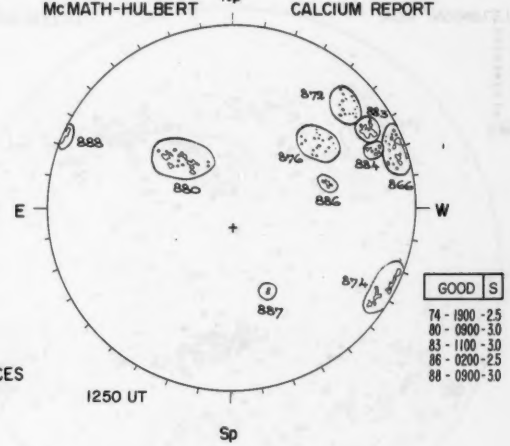
SUNSPOTS

PROMINENCES

1451 UT

McMATH-HULBERT

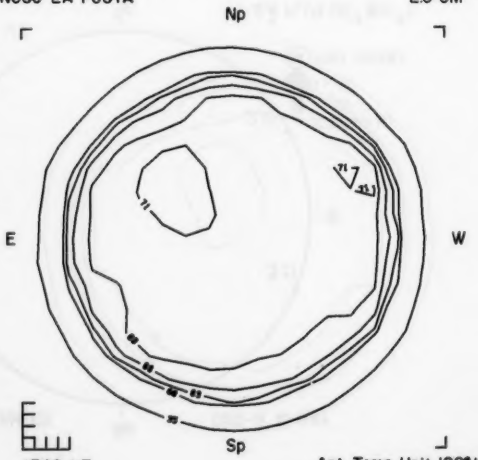
CALCIUM REPORT



1250 UT

GOOD	S
74 - 1900 - 2.5	
80 - 0900 - 3.0	
83 - 1100 - 3.0	
86 - 0200 - 2.5	
88 - 0900 - 3.0	

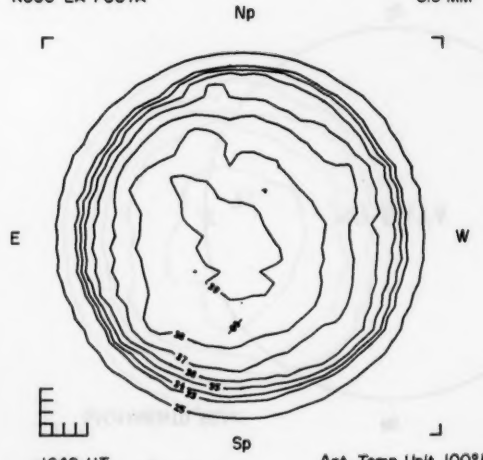
NOSC LA POSTA 2.0 CM



1748 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

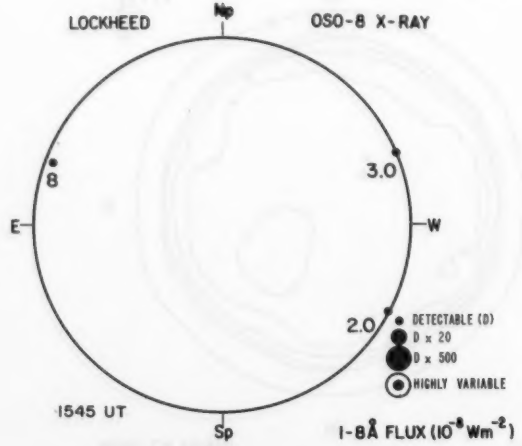


1649 UT

Ant. Temp. Unit 100°K

AUGUST 3, 1977 (P = 11.58, B_o = 5.94, L_o = 52.47)

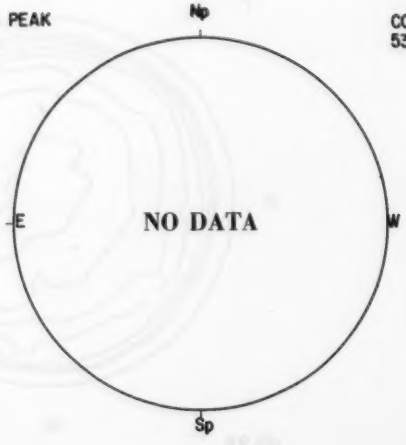
LOCKHEED — OSO-8 X-RAY



1545 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

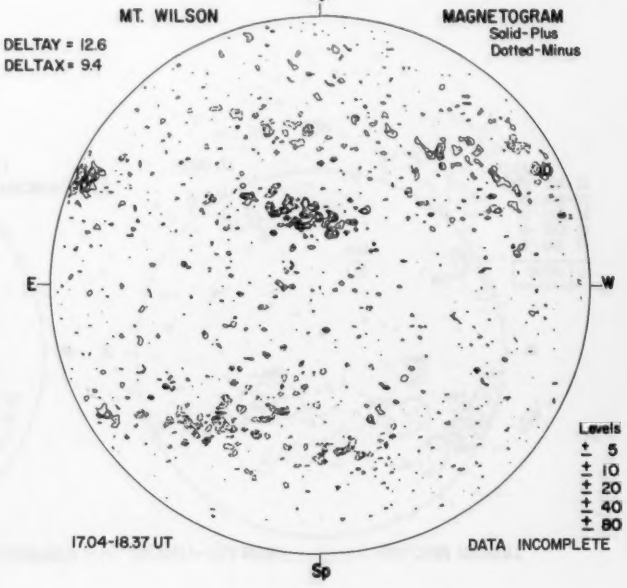


KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus

1540 UT

MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

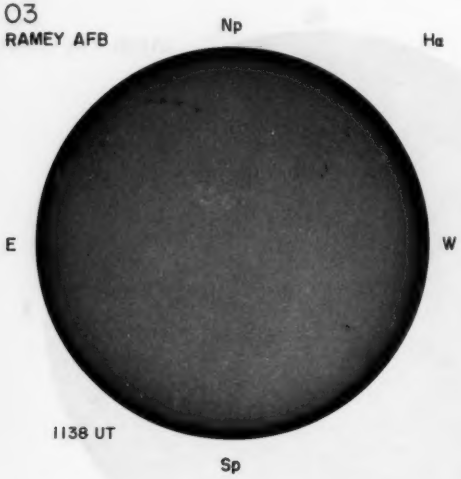


17.04-18.37 UT

DATA INCOMPLETE

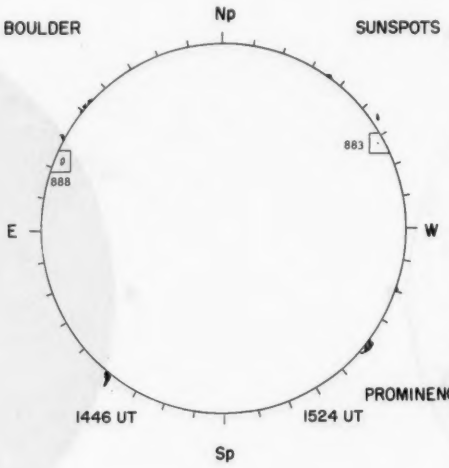
03

RAMEY AFB



1138 UT

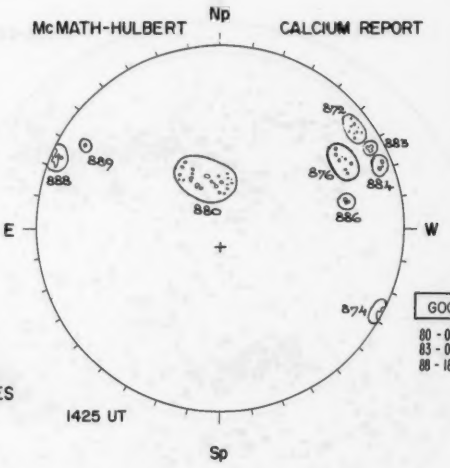
Hα BOULDER



1446 UT 1524 UT

SUNSPOTS

McMATH-HULBERT



1425 UT

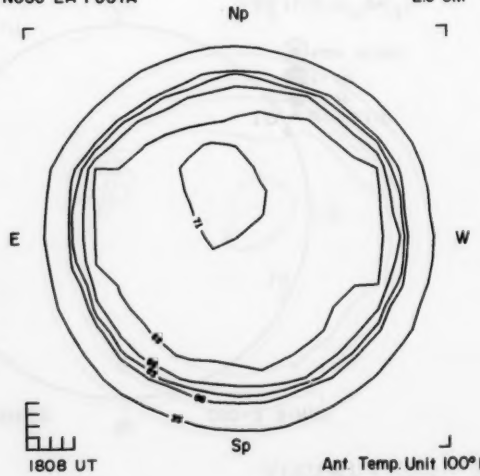
CALCIUM REPORT

GOOD	S

80 - 0600 - 25
83 - 0700 - 30
88 - 1800 - 35

PROMINENCES

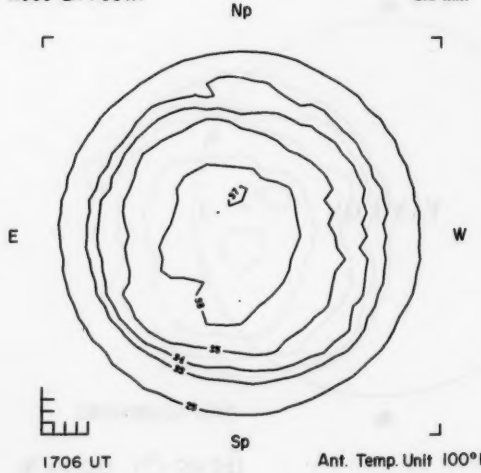
NOSC LA POSTA 2.0 CM



1808 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

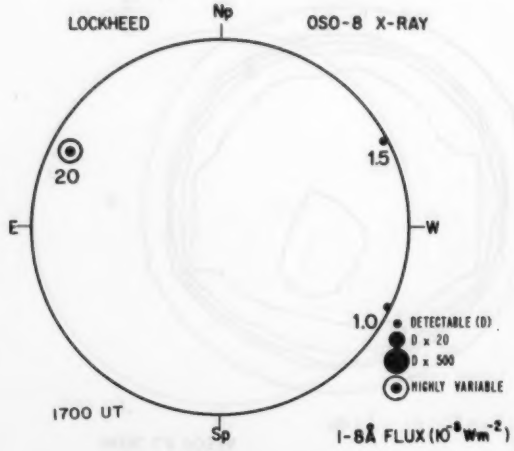


1706 UT

Ant. Temp. Unit 100°K

AUGUST 4, 1977 (P = 11.97, B_o = 6.01, L_o = 39.24)

LOCKHEED — OSO-8 X-RAY

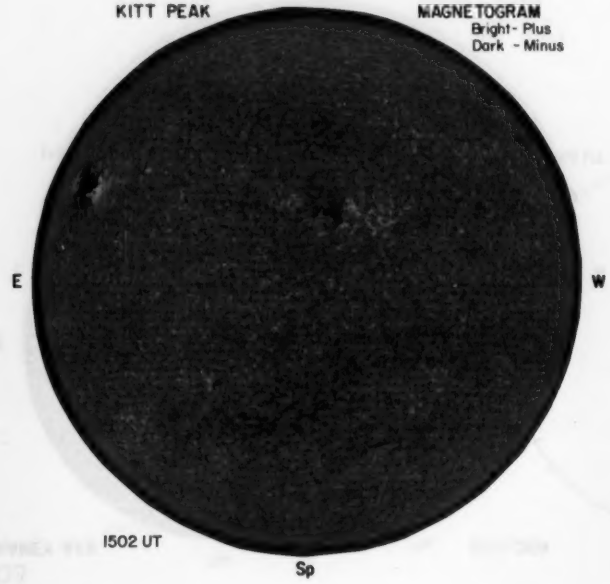


1700 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å

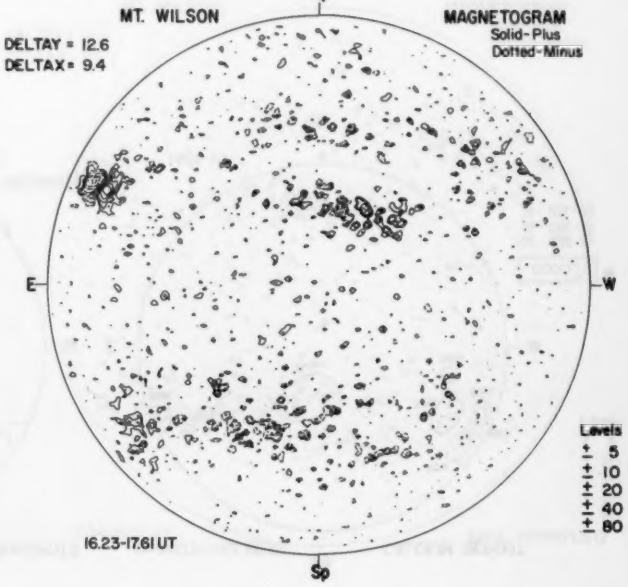
KITT PEAK — MAGNETOGRAM Bright - Plus Dark - Minus



1502 UT

MT. WILSON — MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY = 12.6
DELTAX = 9.4

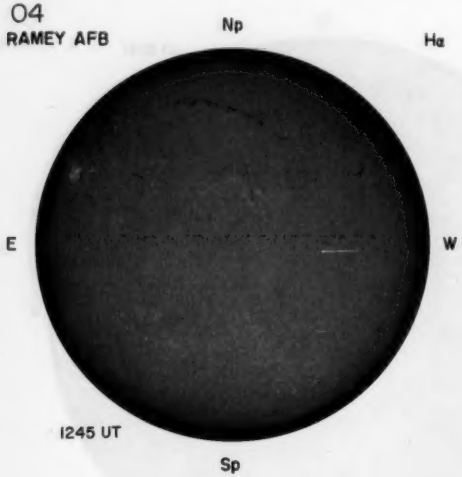


16.23-17.61 UT

Sp

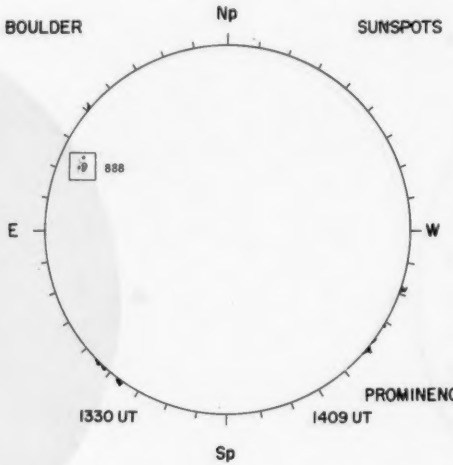
04

RAMEY AFB



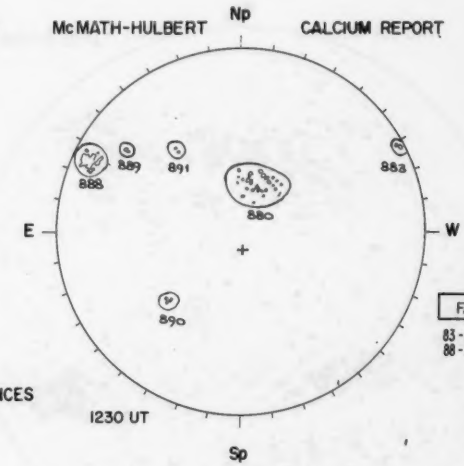
1245 UT

Hα BOULDER



1330 UT

SUNSPOTS



1409 UT

PROMINENCES

McMATH-HULBERT

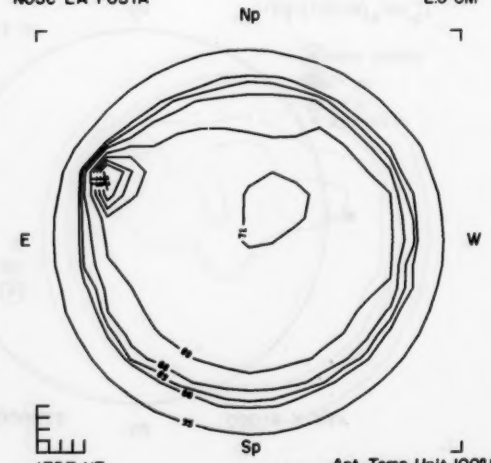
1230 UT

CALCIUM REPORT

FAIR	S

83 - 0500 - 2.5
88 - 2700 - 4.0

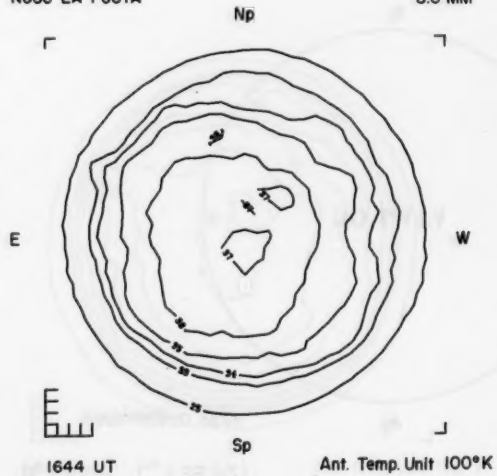
NOSC LA POSTA 2.0 CM



1757 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

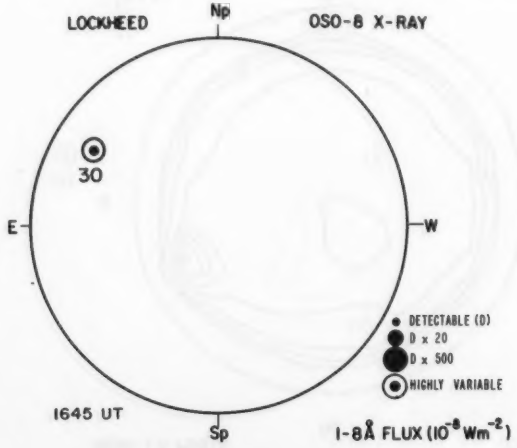


1644 UT

Ant. Temp. Unit 100°K

AUGUST 5, 1977 (P = 12.35, B_o = 6.08, L_o = 26.02)

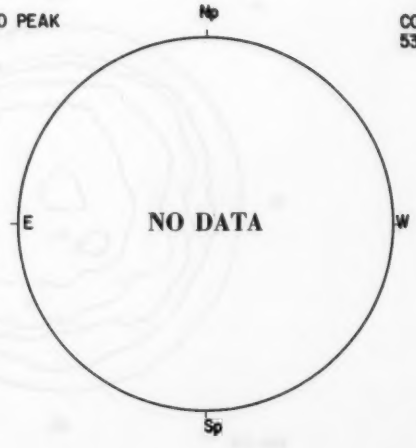
LOCKHEED — OSO-8 X-RAY



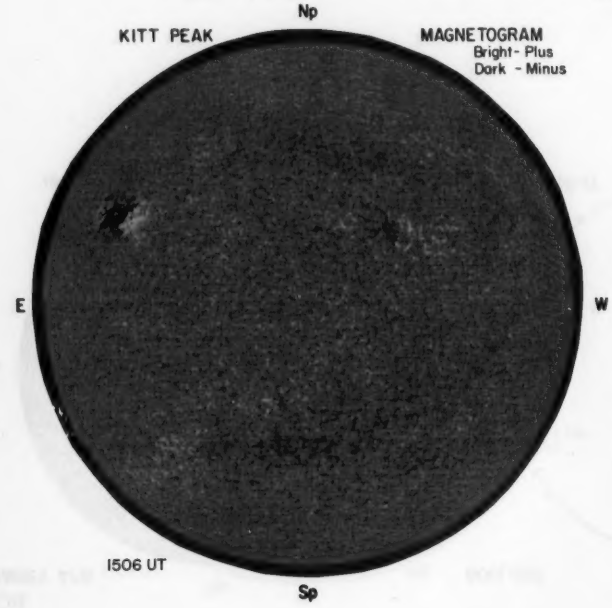
1645 UT

I-8Å FLUX (10^{-6} Wm^{-2})

SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å



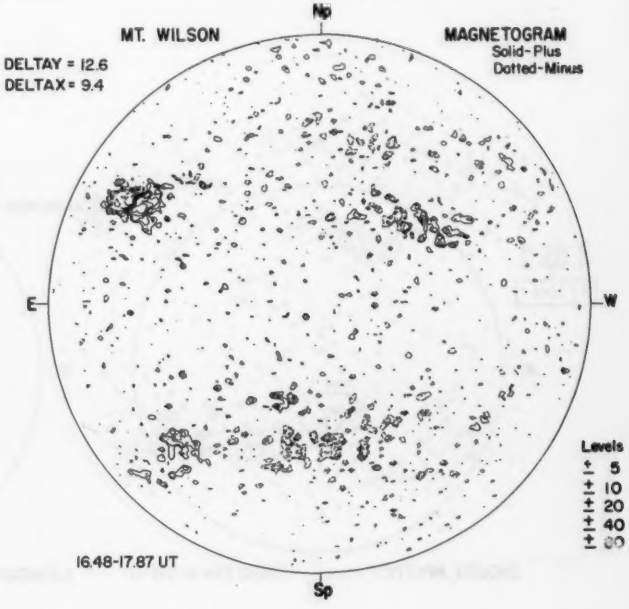
KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus



1506 UT

MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus

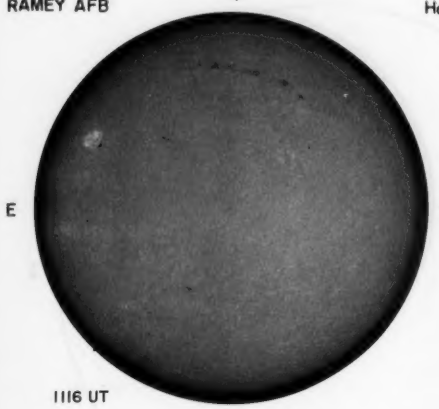
DELTAY = 12.6
DELTAX = 9.4



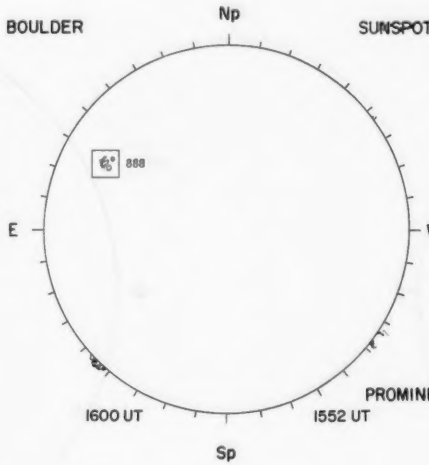
16.48-17.87 UT

05

RAMEY AFB

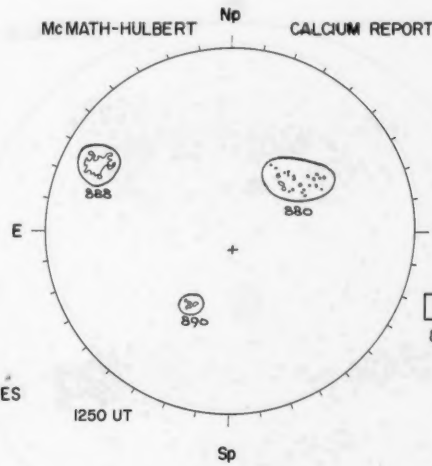


Hα BOULDER



SUNSPOTS

McMATH-HULBERT



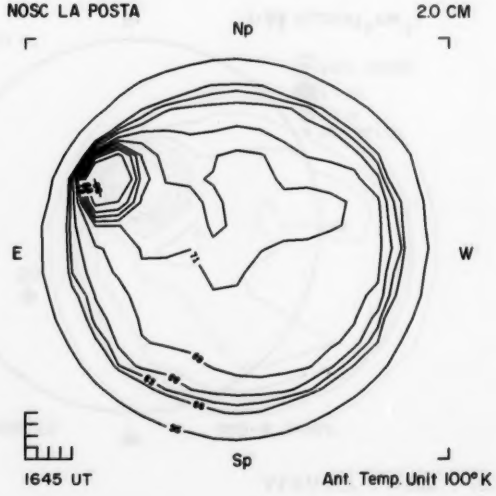
CALCIUM REPORT

FAIR D

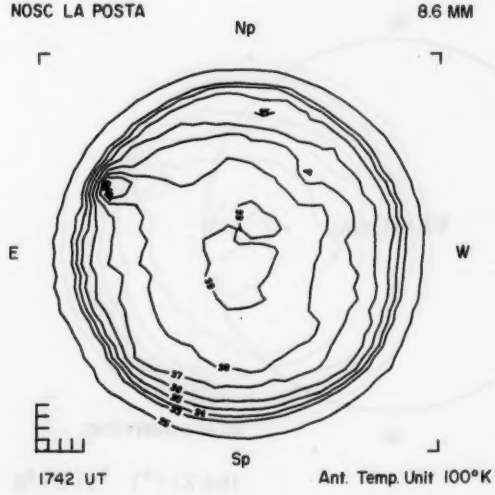
88 - 3500 - 4.0

PROMINENCES

NOSC LA POSTA 2.0 CM

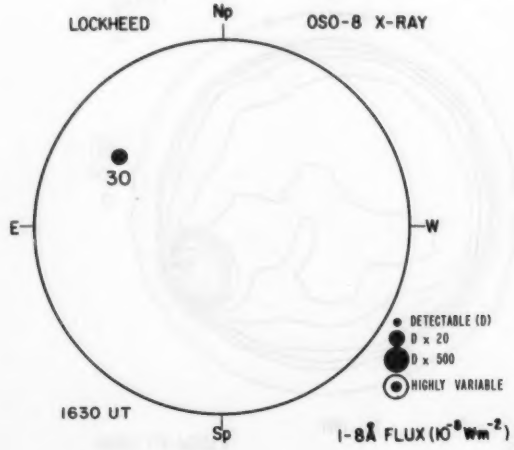


NOSC LA POSTA 8.6 MM

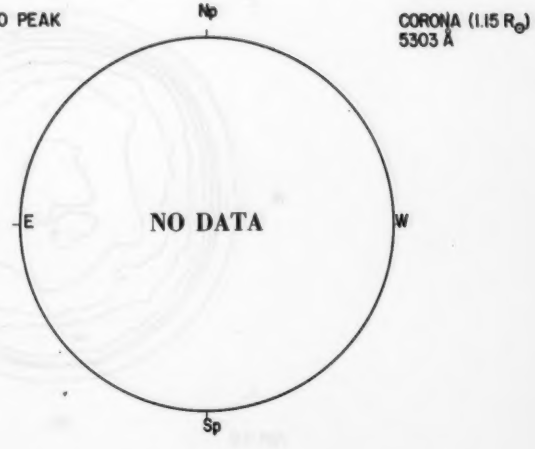


AUGUST 6, 1977 (P = 12.74, B_o = 6.14, L_o = 12.79)

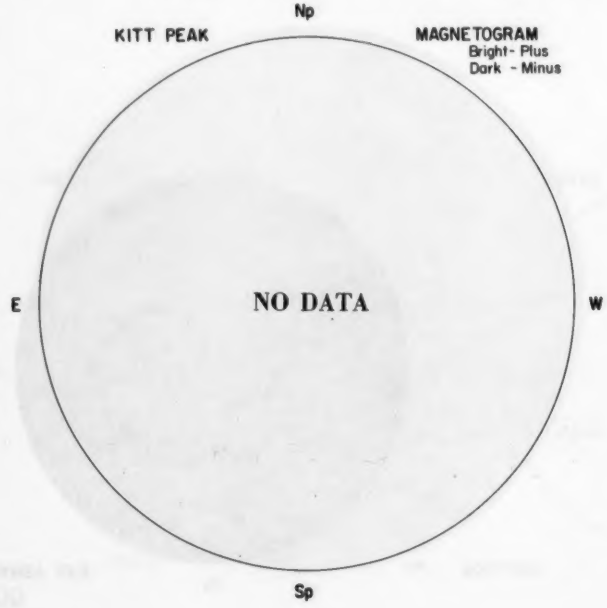
LOCKHEED — OSO-8 X-RAY



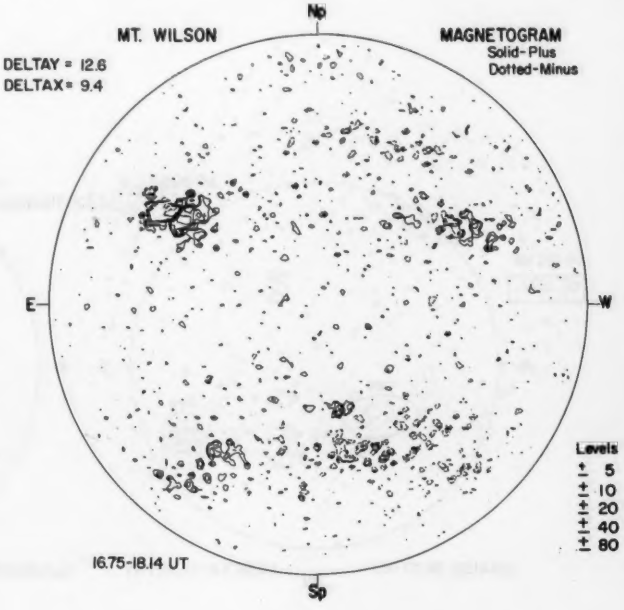
SACRAMENTO PEAK — CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK — MAGNETOGRAM
Bright - Plus
Dark - Minus

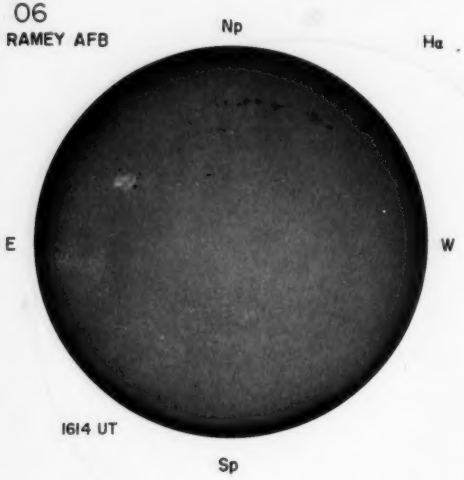


MT. WILSON — MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.4



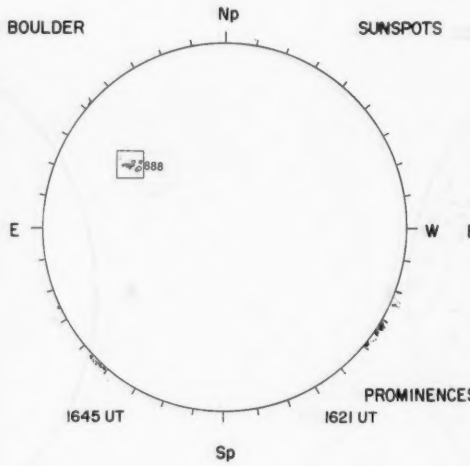
06

RAMEY AFB



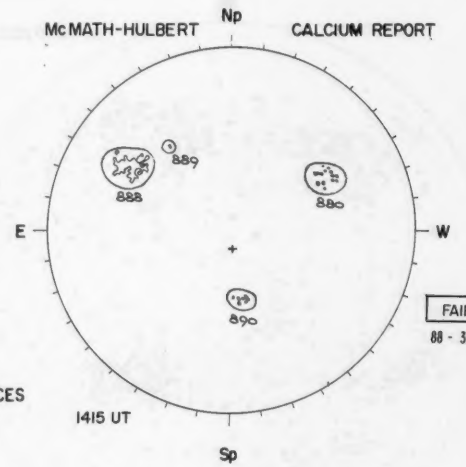
1614 UT

Hα . BOULDER



1645 UT

SUNSPOTS



1621 UT 1415 UT

McMATH-HULBERT

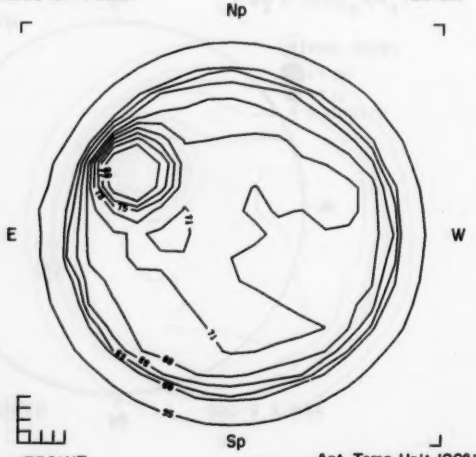
CALCIUM REPORT

FAIR | M

88 - 3100-35

PROMINENCES

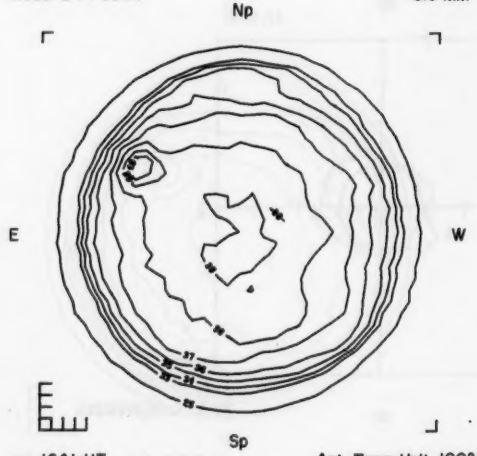
NOSC LA POSTA 2.0 CM



1756 UT

Ant. Temp. Unit 100°K

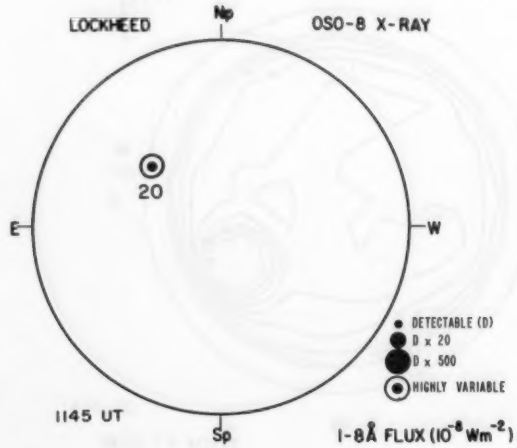
NOSC LA POSTA 8.6 MM

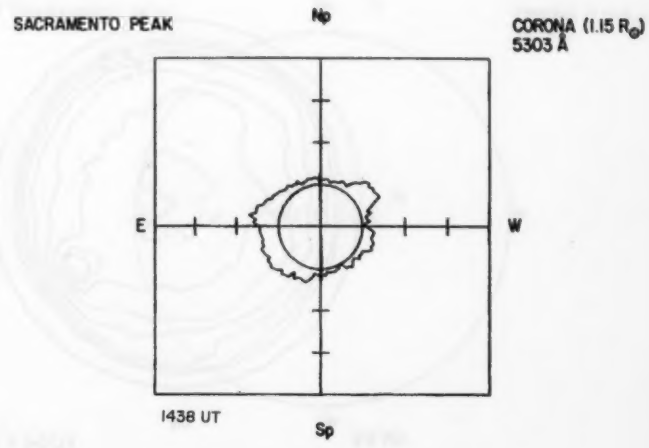


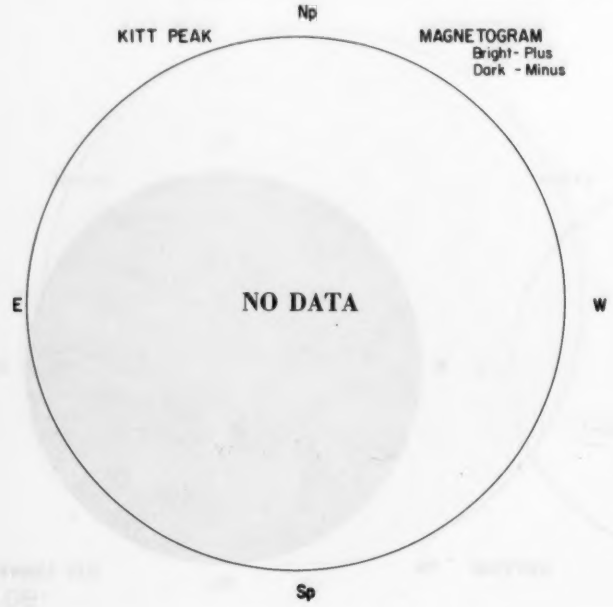
1641 UT

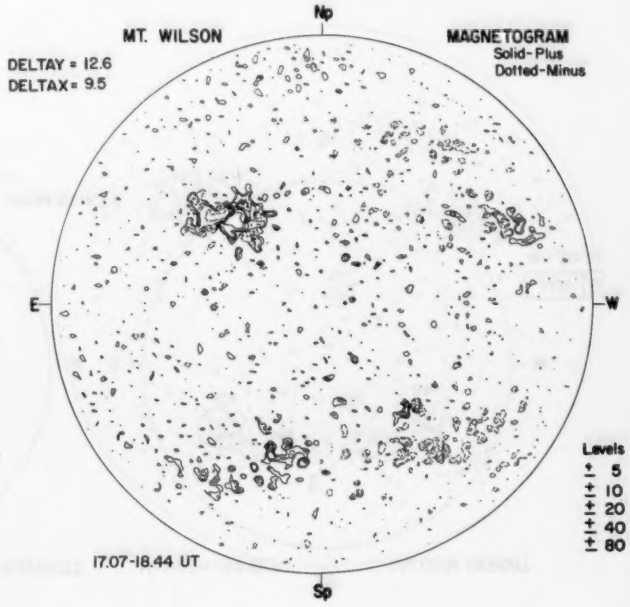
Ant. Temp. Unit 100°K

AUGUST 7, 1977 (P = 13.11, B_0 = 6.21, L_0 = 359.57)



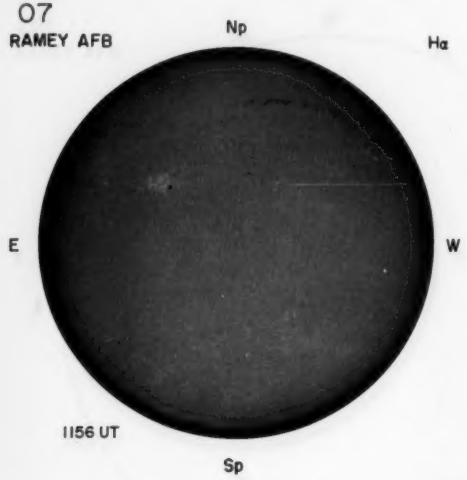




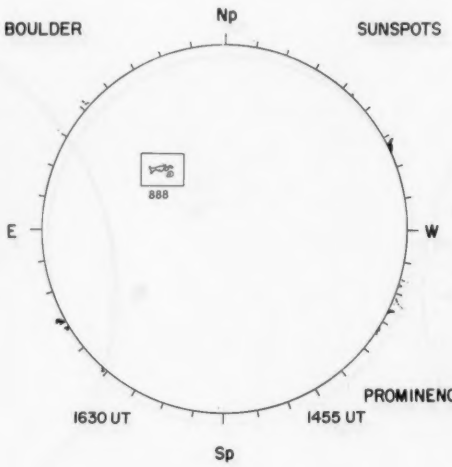


07

RAMEY AFB



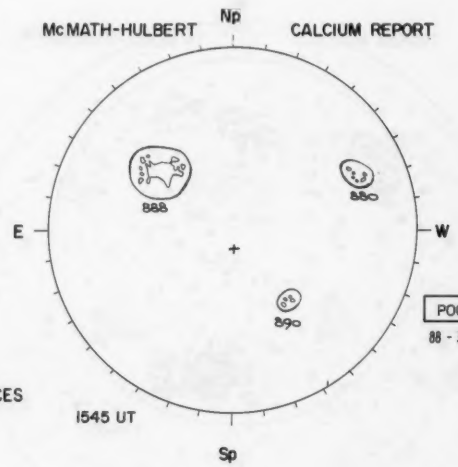
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT

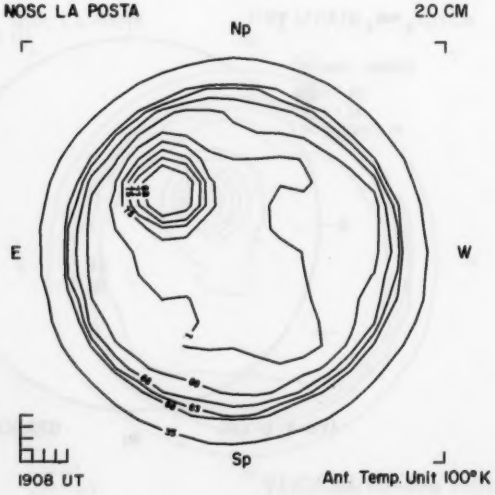


CALCIUM REPORT

POOR D

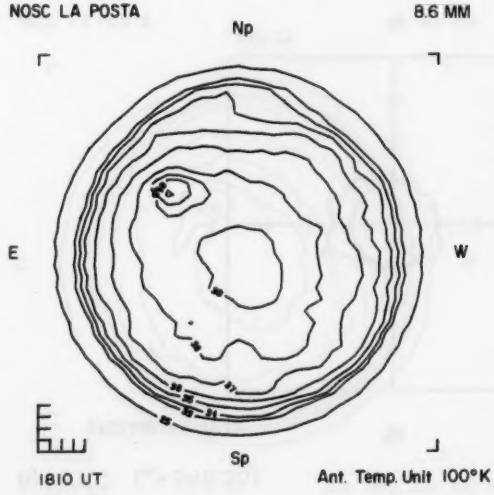
88 - 3000-35

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

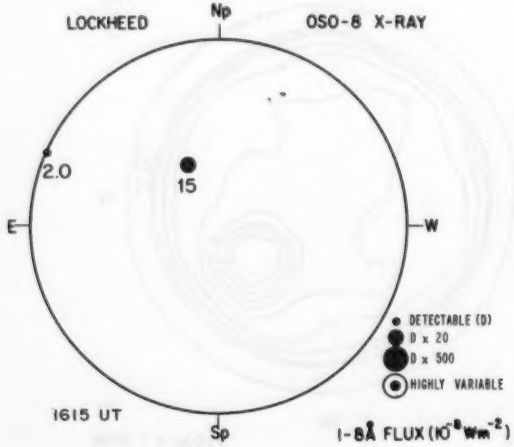
NOSC LA POSTA 8.6 MM



Ant. Temp. Unit 100°K

AUGUST 8, 1977 (P = 13.49, B_o = 6.27, L_o = 346.35)

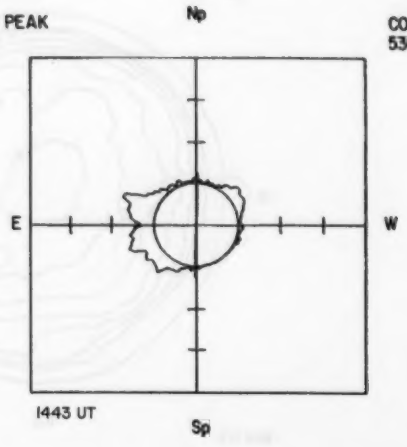
LOCKHEED OSO-8 X-RAY



1615 UT

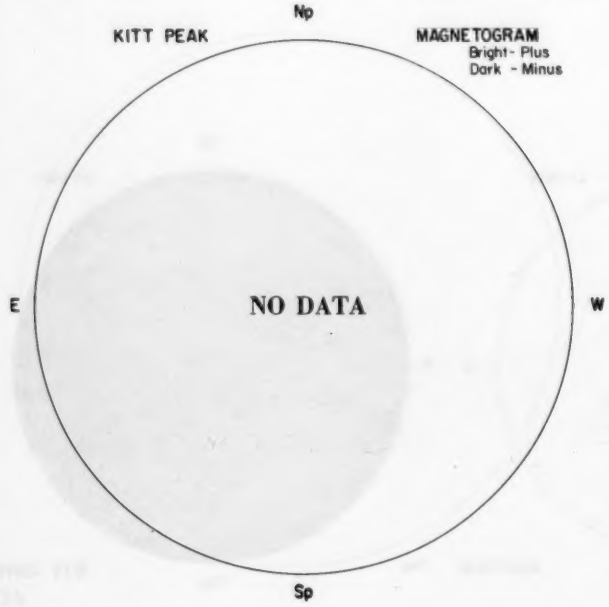
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

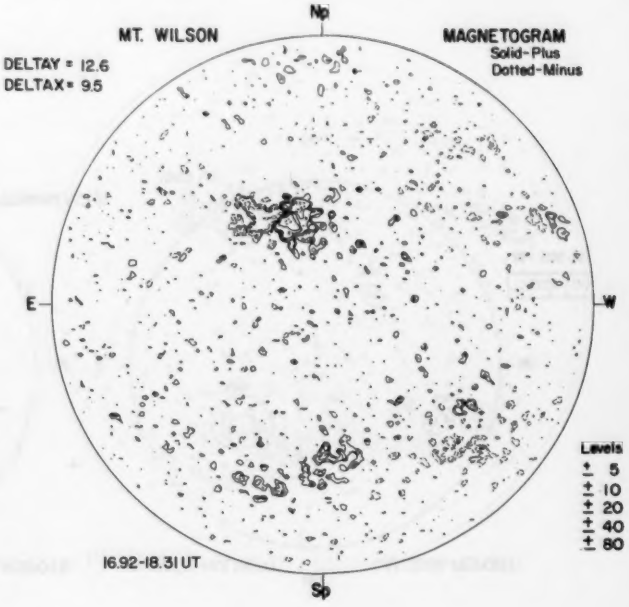


1443 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



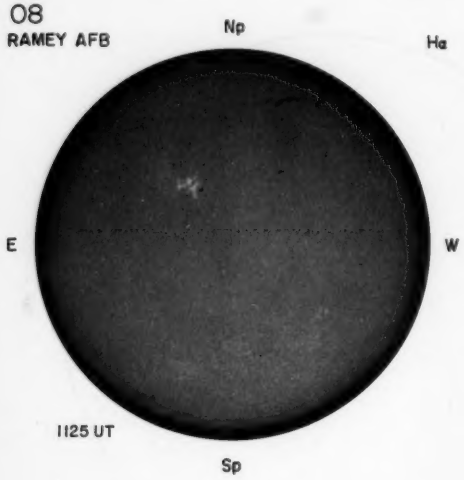
16.92-18.31 UT

Sp

Sp

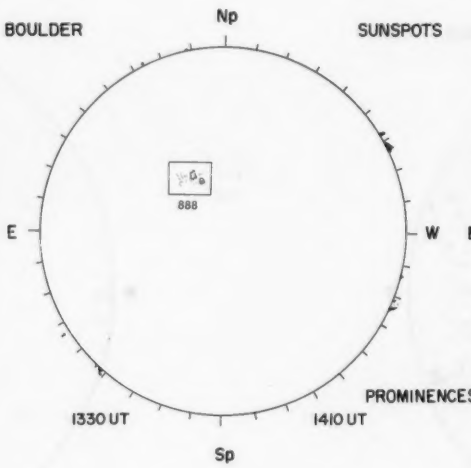
08

RAMEY AFB



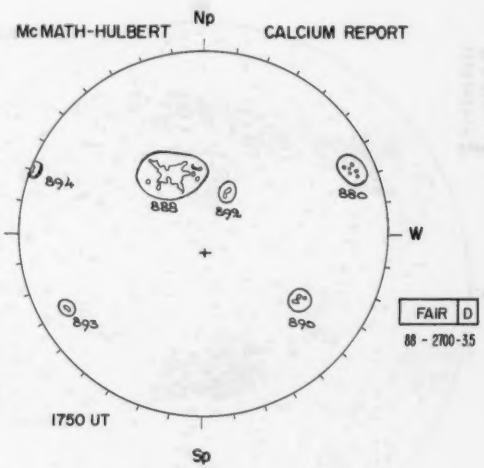
Hα

BOULDER



SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

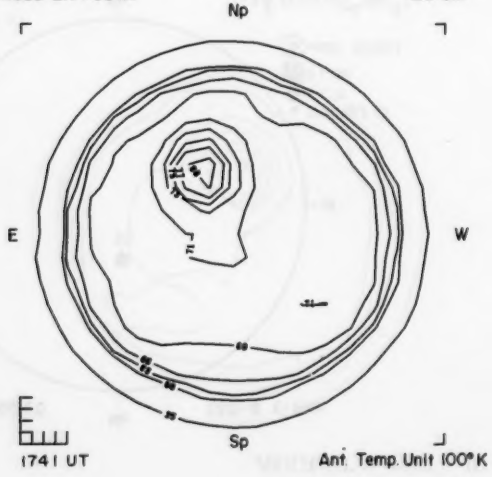
FAIR D

88 - 2700-35

PROMINENCES

NOSC LA POSTA

2.0 CM

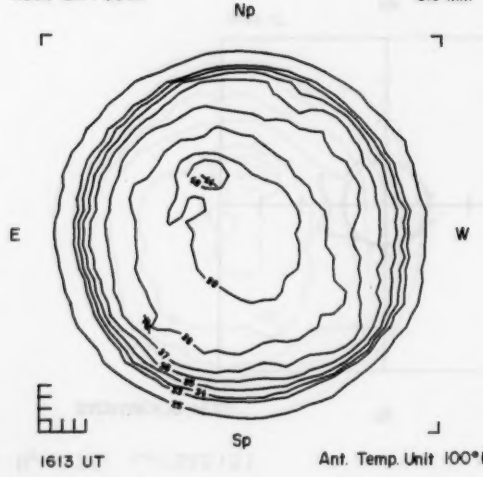


1741 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

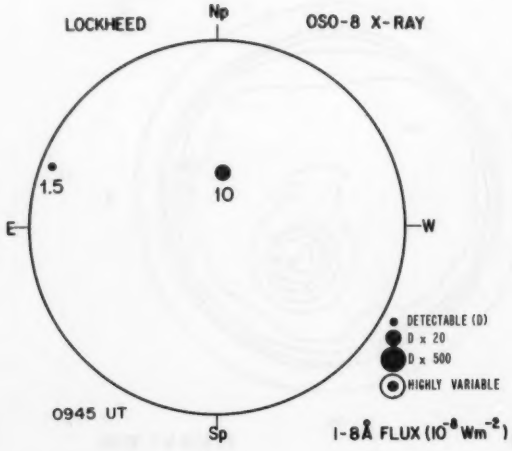


1613 UT

Ant. Temp. Unit 100°K

AUGUST 9, 1977 (P = 13.86, B_o = 6.33, L_o = 333.13)

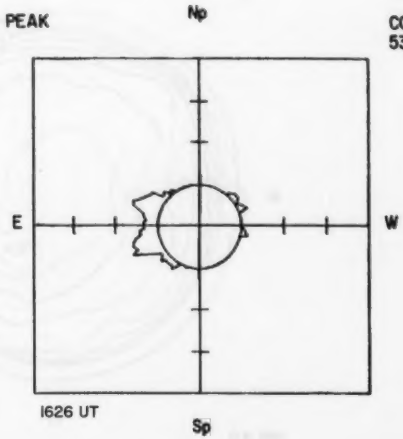
LOCKHEED OSO-8 X-RAY



0945 UT

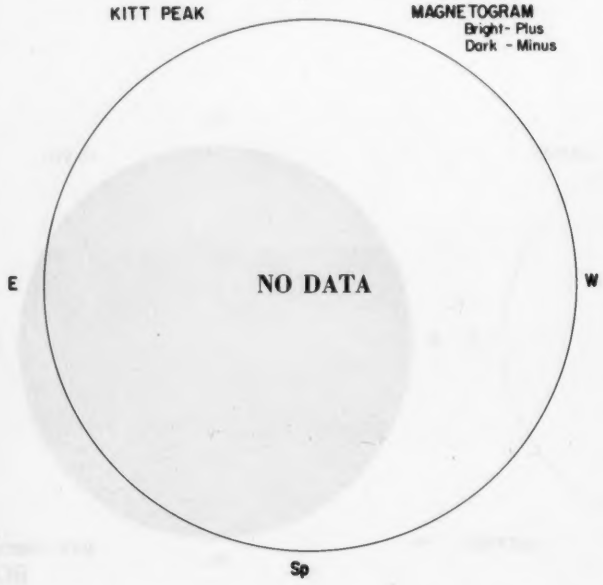
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

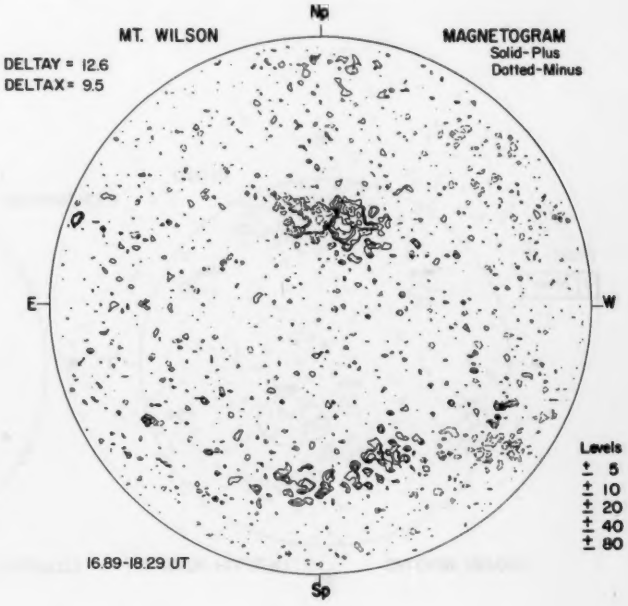


1626 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



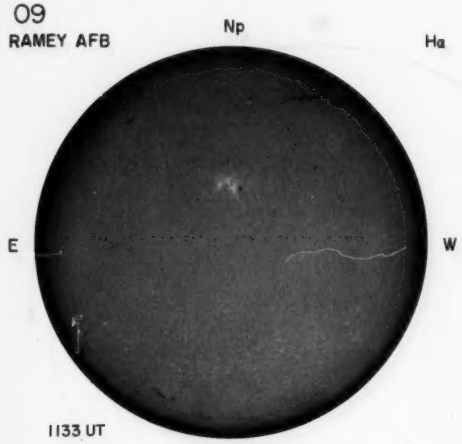
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.89-18.29 UT

09

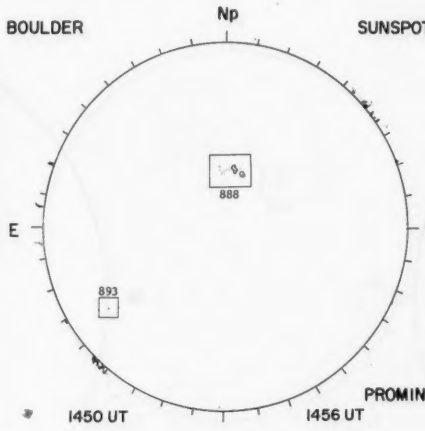
RAMEY AFB



1133 UT

Hα

BOULDER



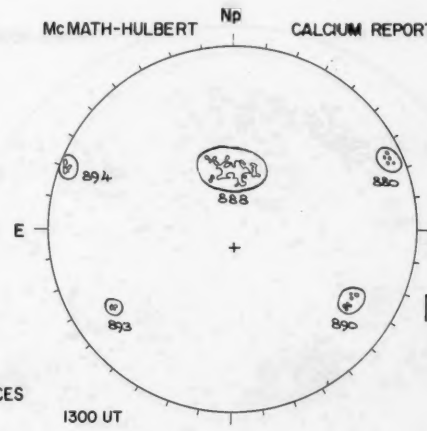
1450 UT

SUNSPOTS

PROMINENCES

1456 UT

McMATH-HULBERT



1300 UT

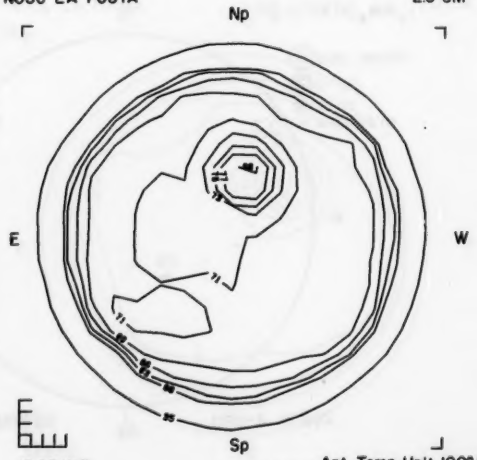
CALCIUM REPORT

FAIR | S

88 - 2700-30
93 - 0200-25

NOSC LA POSTA

2.0 CM

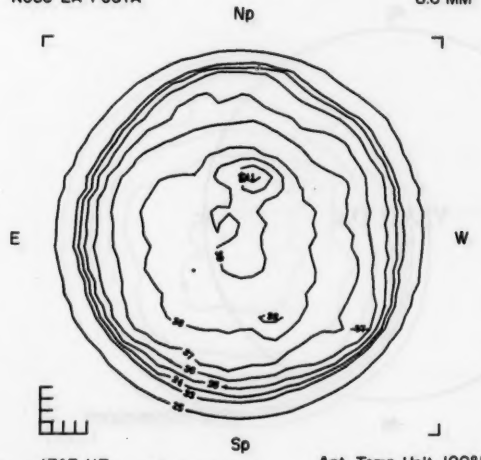


1942 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

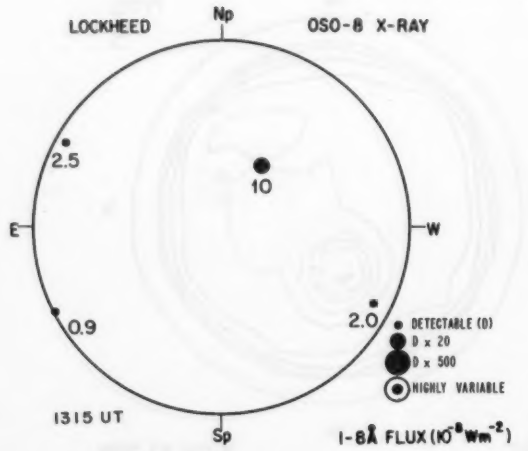
8.6 MM

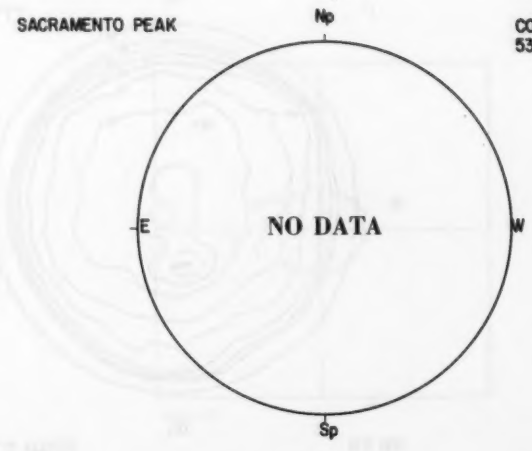


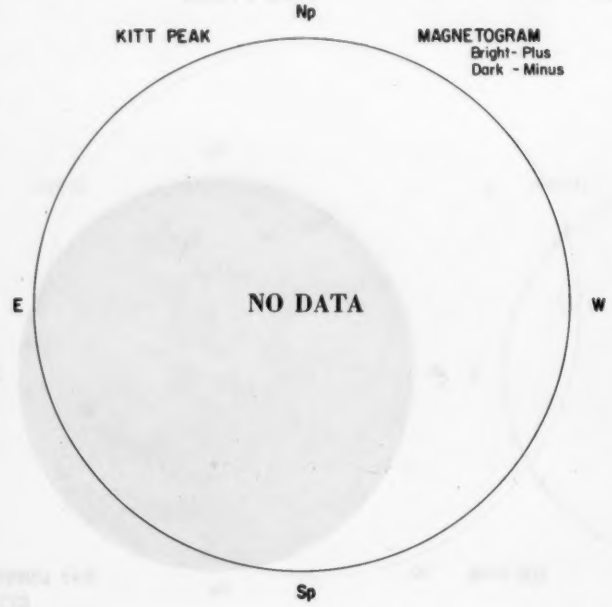
1747 UT

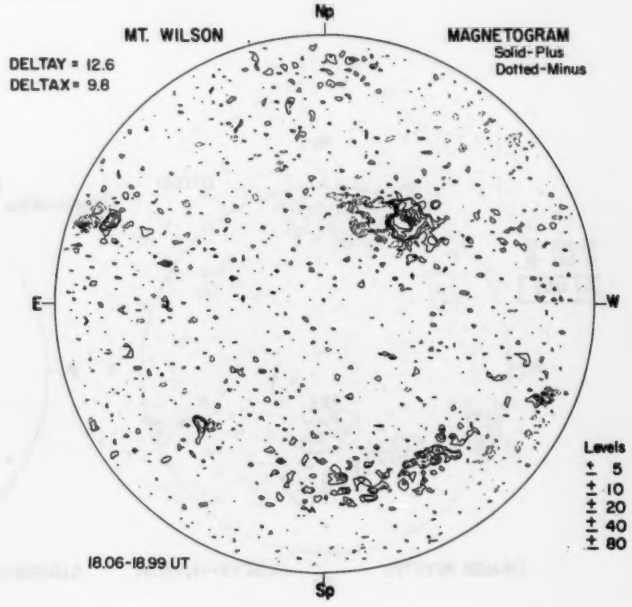
Ant. Temp. Unit 100°K

AUGUST 10, 1977 (P = 14.22, B_0 = 6.39, L_0 = 319.91)



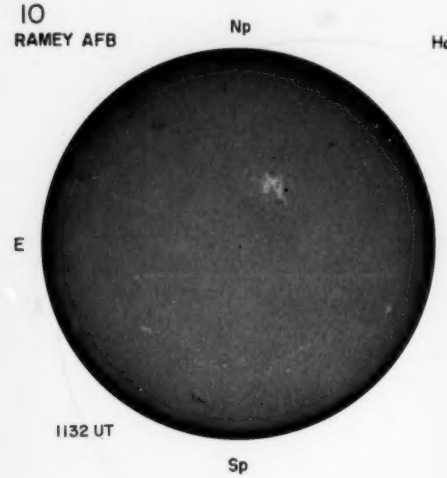






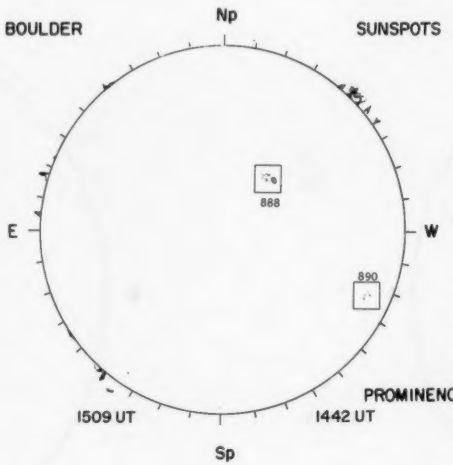
10

RAMEY AFB



1132 UT

Hα BOULDER

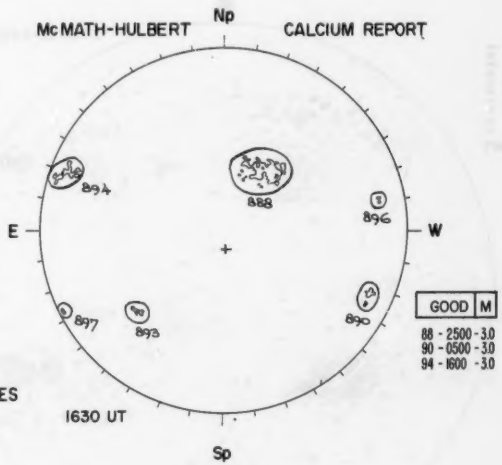


1509 UT

SUNSPOTS

1442 UT

McMATH-HULBERT



1630 UT

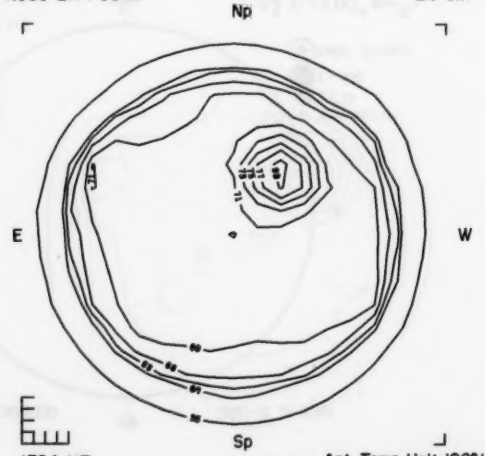
CALCIUM REPORT

GOOD	M

88 - 2500 - 3.0
90 - 0500 - 3.0
94 - 1600 - 3.0

PROMINENCES

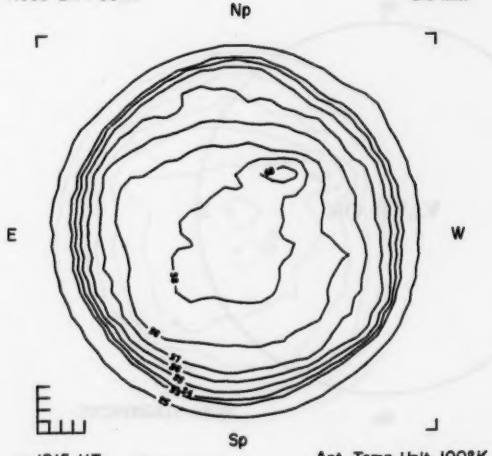
NOSC LA POSTA 2.0 CM



1724 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

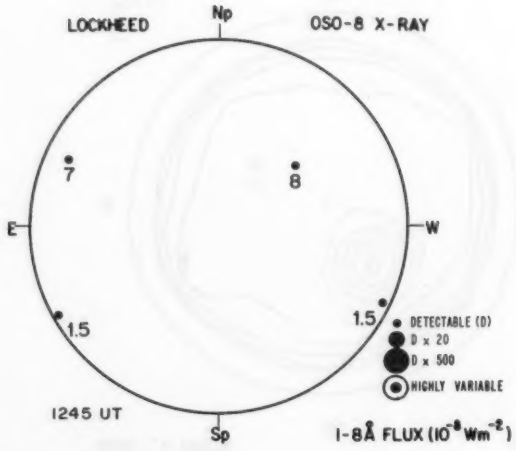


1815 UT

Ant. Temp. Unit 100°K

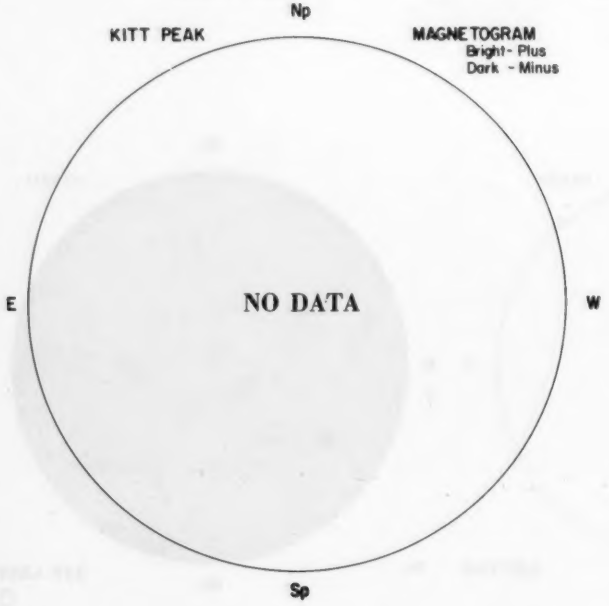
AUGUST 11, 1977 (P = 14.58, B_o = 6.44, L_o = 306.69)

LOCKHEED OSO-8 X-RAY

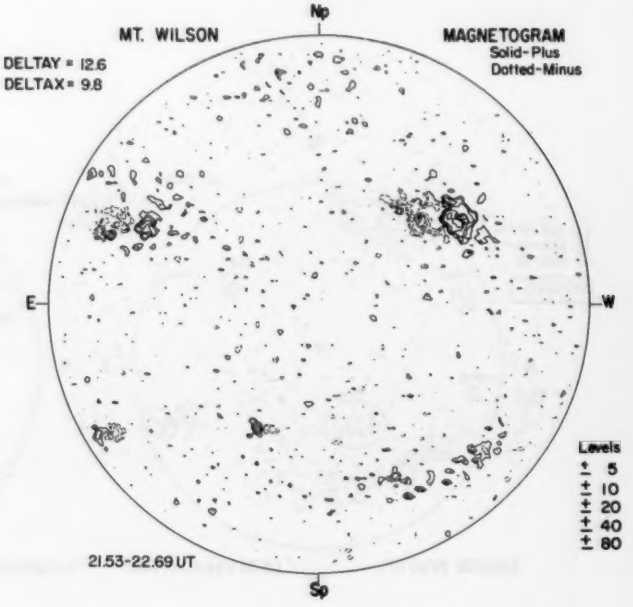


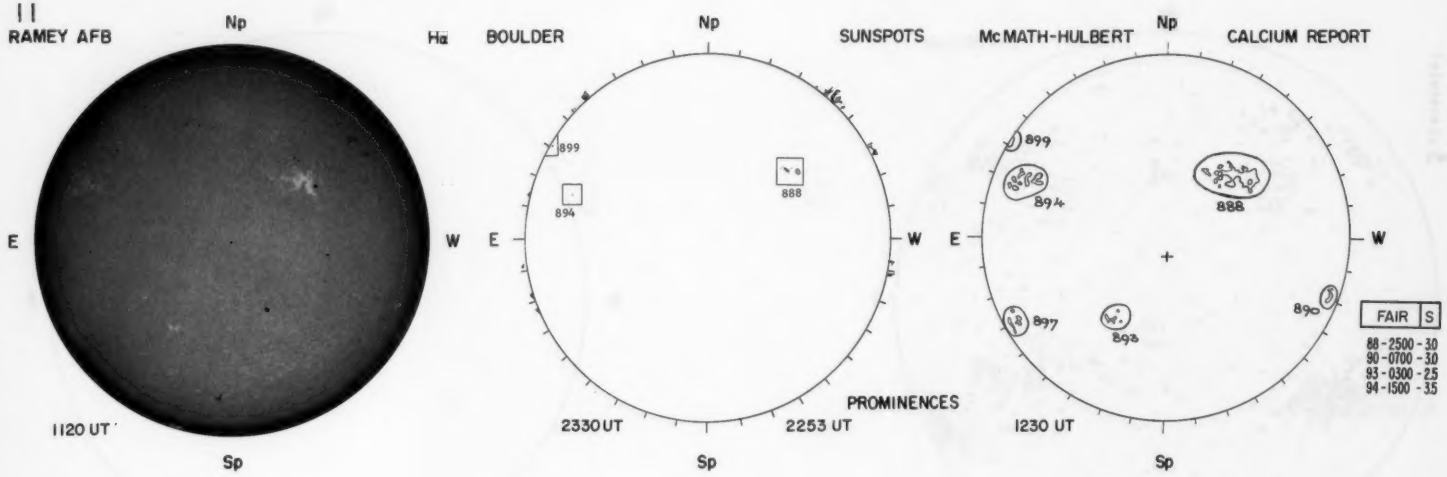
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

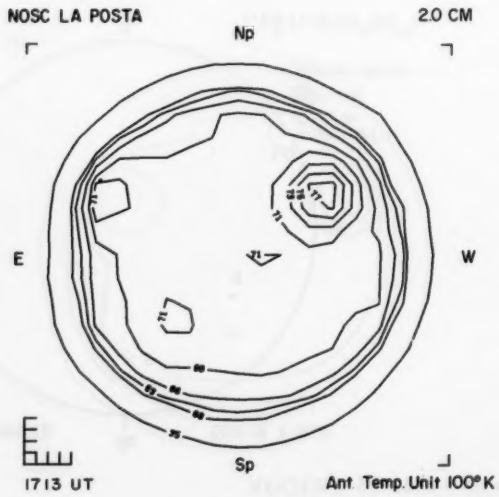
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

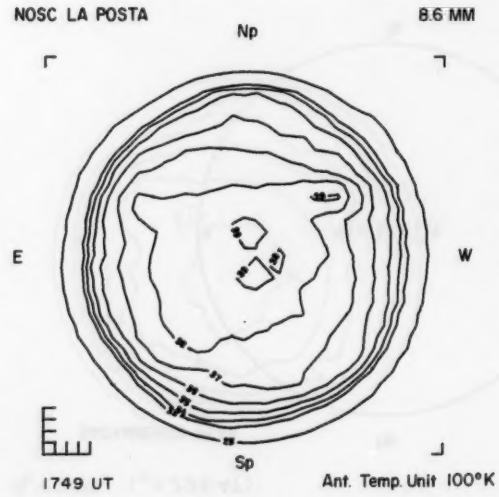


MT. WILSON MAGNETOGRAM
Solid-Plus
Dotted-Minus
DELTAY = 12.6
DELTAX = 9.8

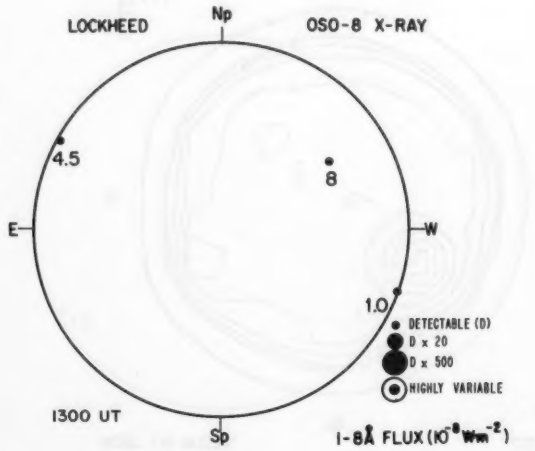


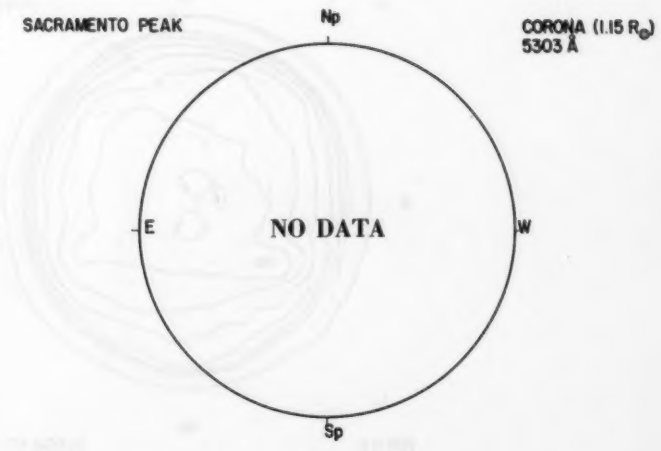

RAMEY AFB
Np
Hα
E
W
Sp
1120 UT
BOULDER
SUNSPOTS
899
894
888
2330 UT
2253 UT
PROMINENCES
McMATH-HULBERT
CALCIUM REPORT
899
894
888
897
893
890
1230 UT
FAIR S
88 - 2500 - 30
90 - 0700 - 30
93 - 0300 - 25
94 - 1500 - 35

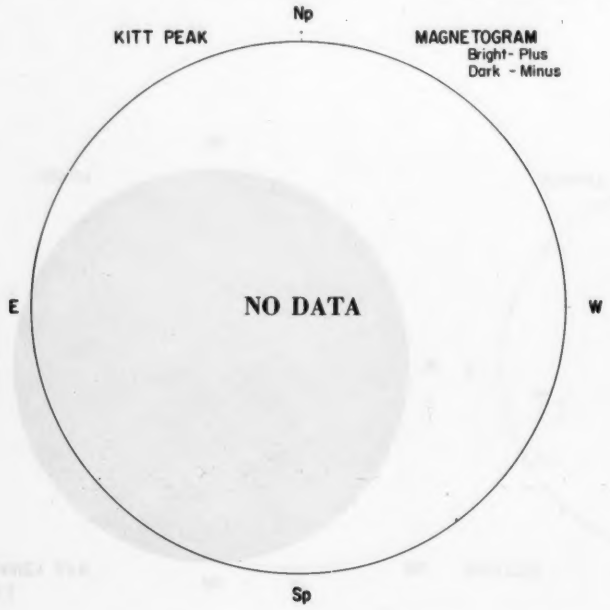

NOSC LA POSTA
2.0 CM
Np
E
W
Sp
1713 UT
Ant. Temp. Unit 100°K

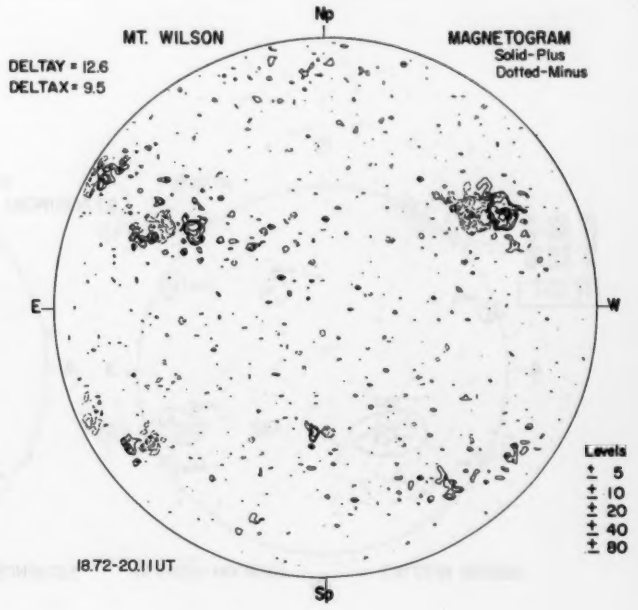

NOSC LA POSTA
8.6 MM
Np
E
W
Sp
1749 UT
Ant. Temp. Unit 100°K

AUGUST 12, 1977 (P = 14.94, B_o = 6.50, L_o = 293.47)



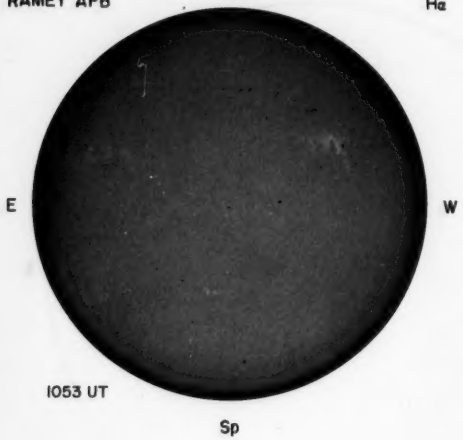






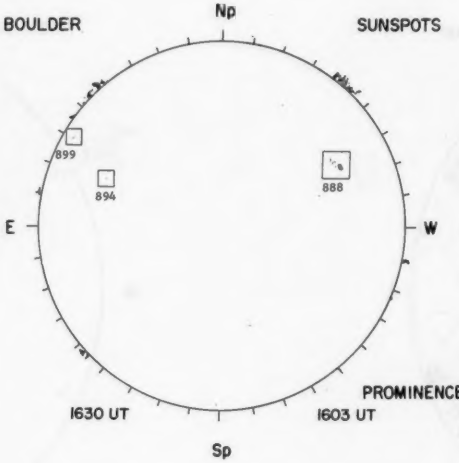
12

RAMEY AFB



1053 UT

Hα BOULDER



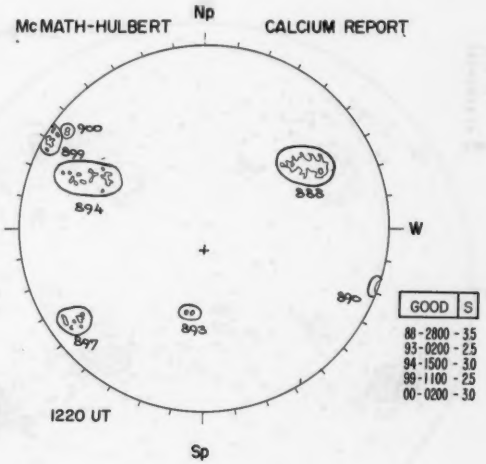
1630 UT

SUNSPOTS

PROMINENCES

1603 UT

McMATH-HULBERT

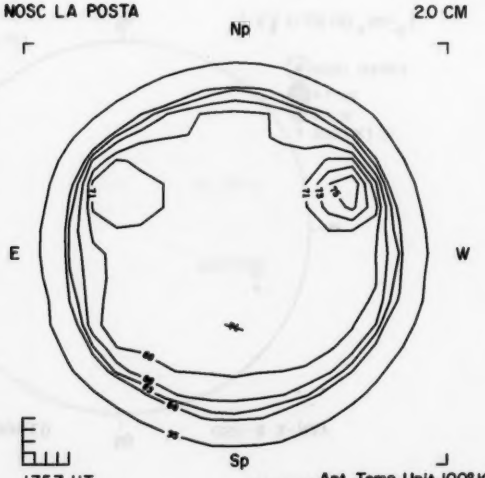


1220 UT

CALCIUM REPORT

GOOD	S
88 - 2800 - 35	
93 - 0200 - 25	
94 - 1500 - 30	
99 - 1100 - 25	
00 - 0200 - 30	

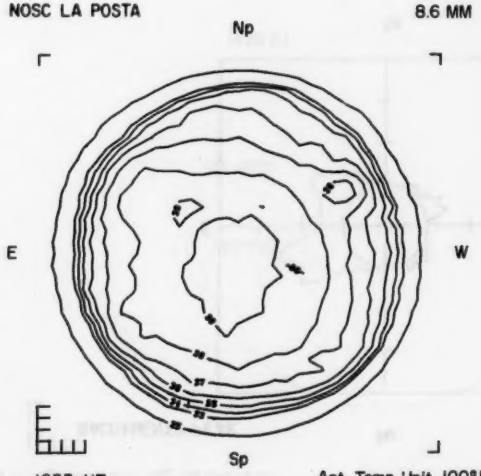
NOSC LA POSTA 2.0 CM



1757 UT

Ant. Temp. Unit 100°K

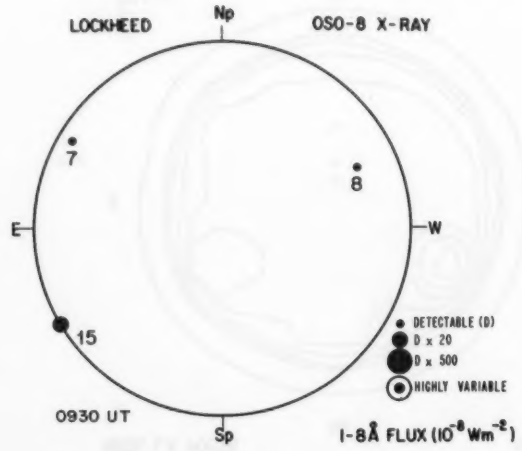
NOSC LA POSTA 8.6 MM

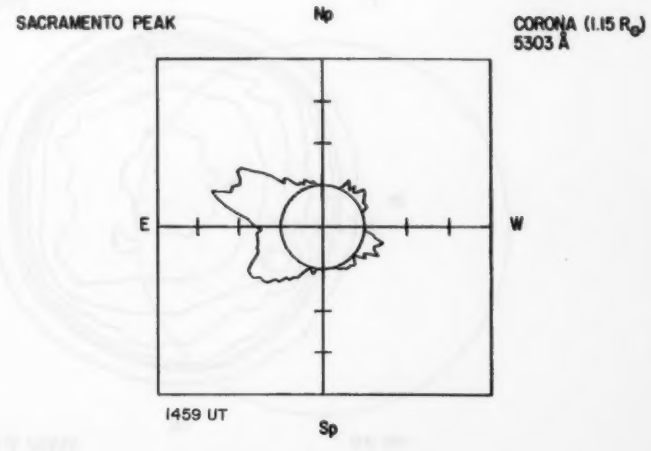


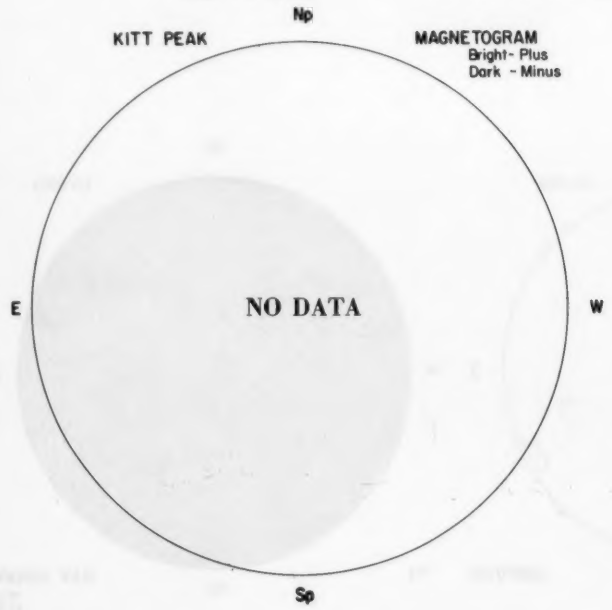
1633 UT

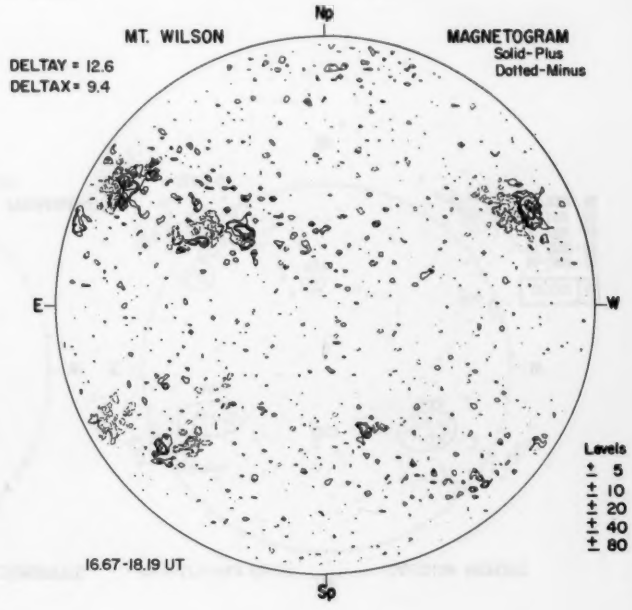
Ant. Temp. Unit 100°K

AUGUST 13, 1977 (P = 15.29, B_0 = 6.55, L_0 = 280.25)



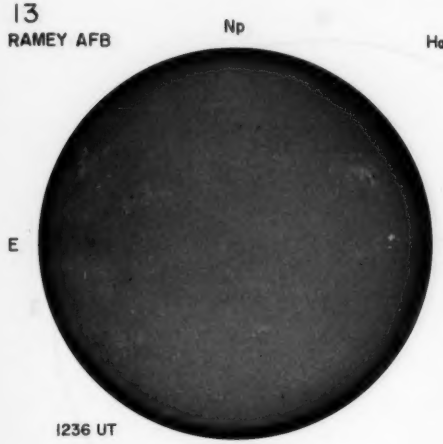






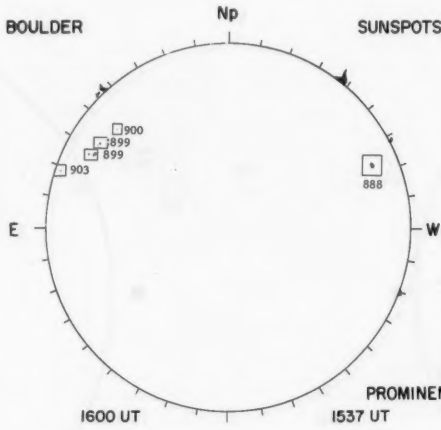
13

RAMEY AFB



1236 UT

Hα BOULDER

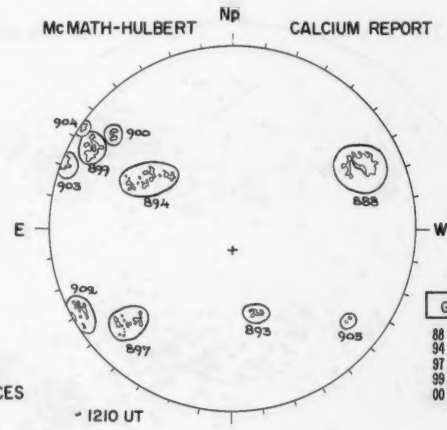


1600 UT

SUNSPOTS

1537 UT

McMATH-HULBERT



1210 UT

CALCIUM REPORT

PROMINENCES

GOOD	M
88 - 2800 - 30	
94 - 1200 - 25	
97 - 0700 - 25	
99 - 1200 - 35	
00 - 0400 - 30	

NOSC LA POSTA

2.0 CM

---- UT

Ant. Temp. Unit 100° K

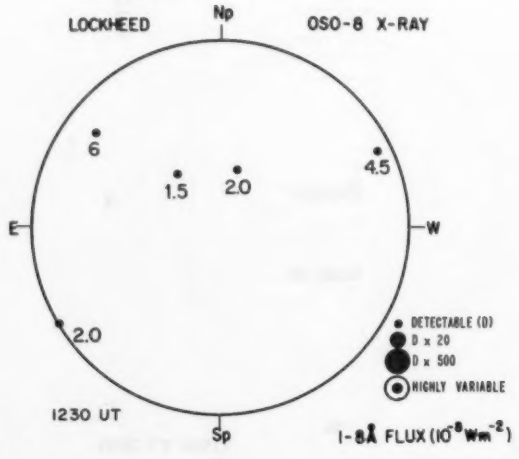
NOSC LA POSTA

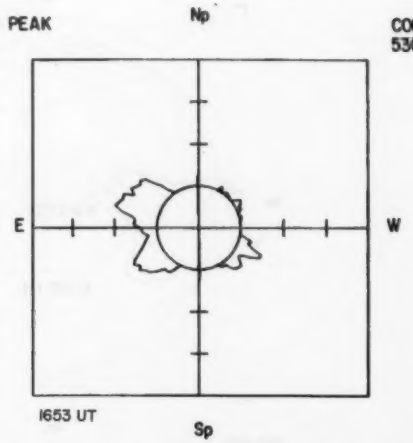
8.6 MM

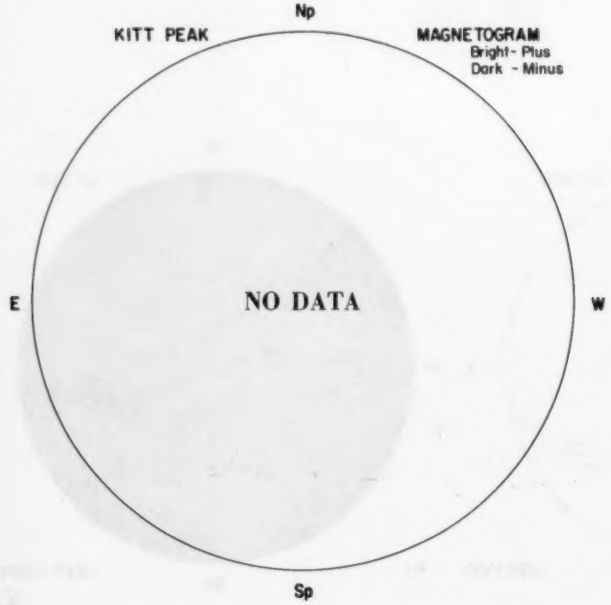
---- UT

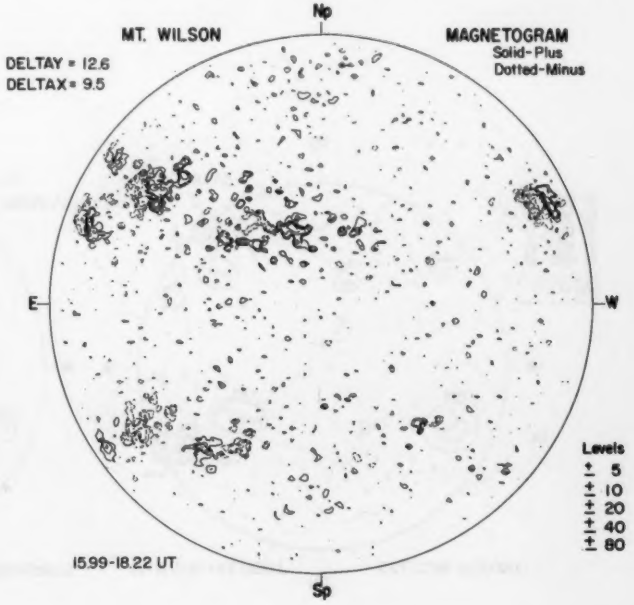
Ant. Temp. Unit 100° K

AUGUST 14, 1977 (P = 15.64, B_0 = 6.60, L_0 = 267.03)



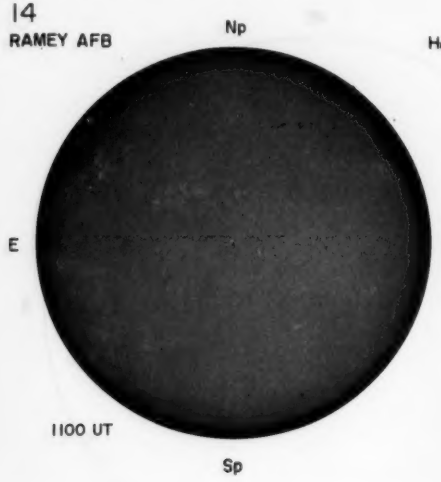






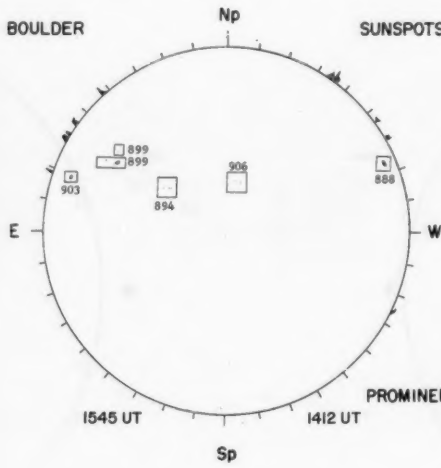
14

RAMEY AFB



1100 UT

BOULDER



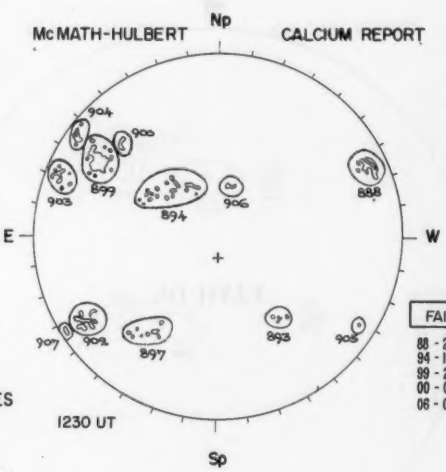
1545 UT

SUNSPOTS

PROMINENCES

1412 UT

McMATH-HULBERT

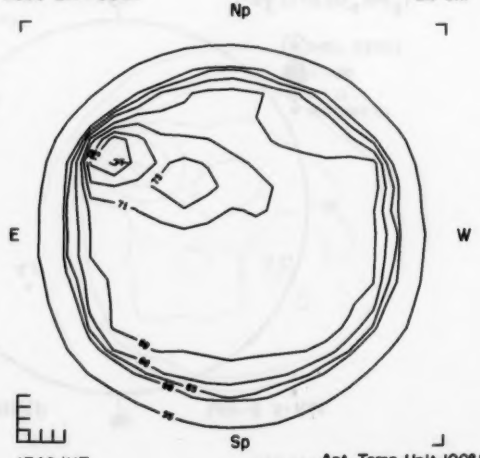


1230 UT

CALCIUM REPORT

FAIR	S
88 - 2500-30	
94 - 1200-25	
99 - 2000-35	
00 - 0400-25	
06 - 0200-25	

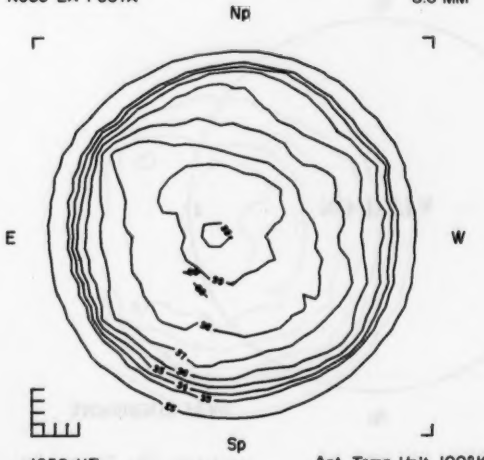
NOSC LA POSTA



1749 UT

Ant. Temp. Unit 100°K

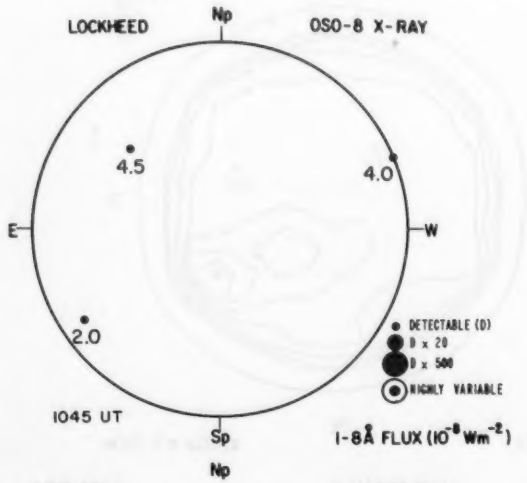
NOSC LA POSTA

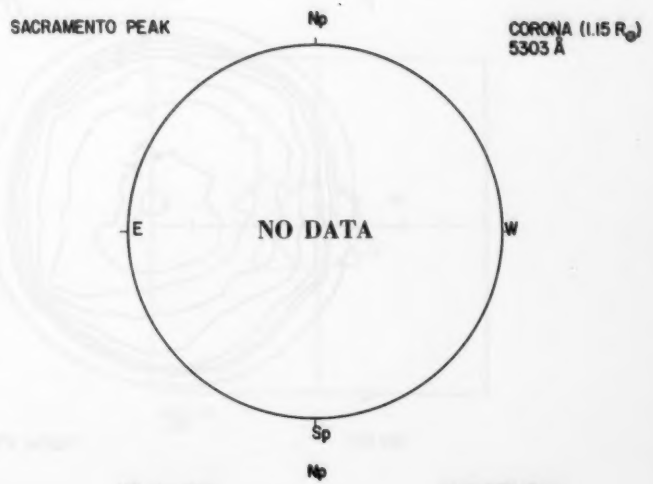


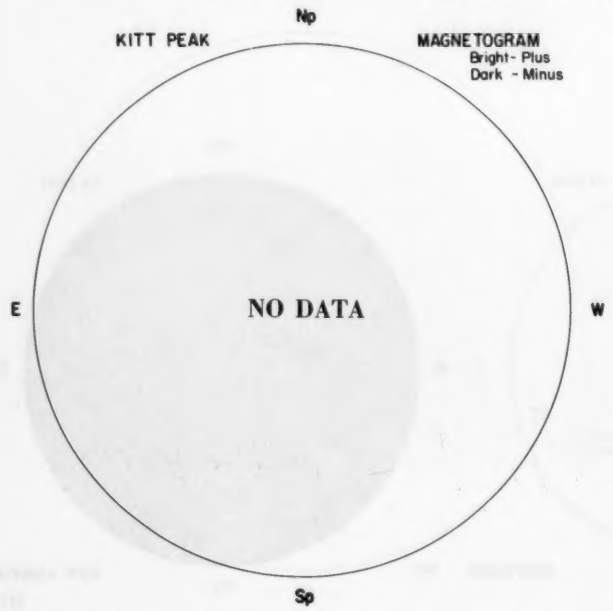
1650 UT

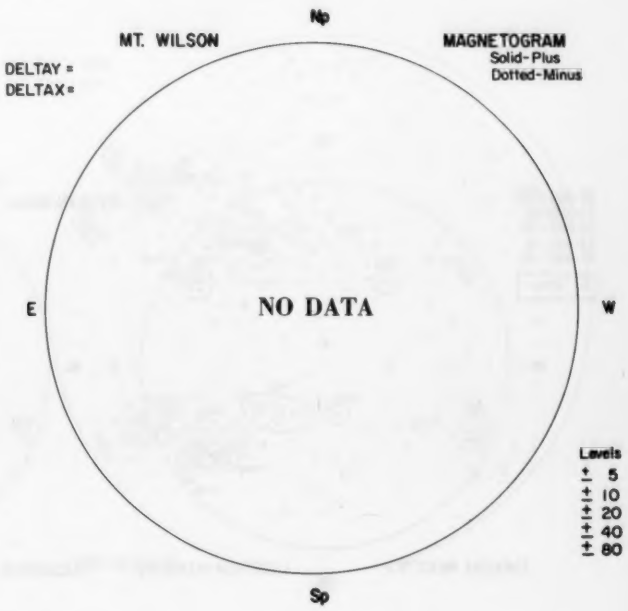
Ant. Temp. Unit 100°K

AUGUST 15, 1977 (P = 15.99, B_o = 6.65, L_o = 253.81)



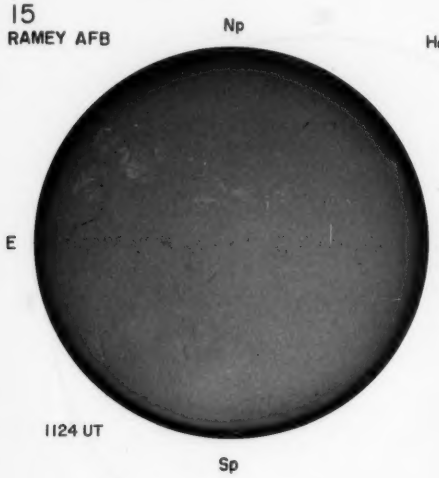






15

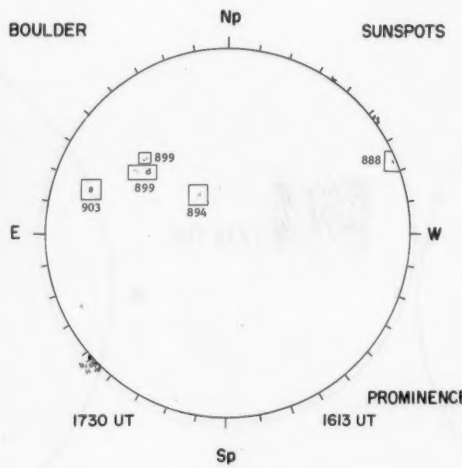
RAMEY AFB



1124 UT

Hα

BOULDER



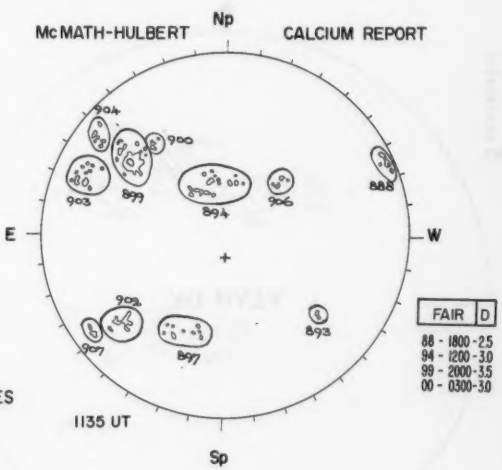
1730 UT

SUNSPOTS

PROMINENCES

1613 UT

McMATH-HULBERT



1135 UT

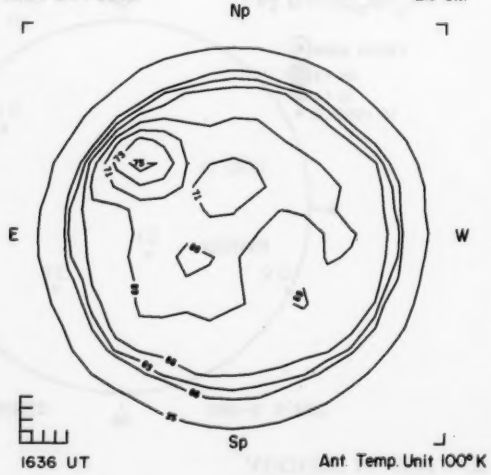
CALCIUM REPORT

FAIR	D

88 - 1800 - 2.5
94 - 1200 - 3.0
99 - 2000 - 3.5
00 - 0300 - 3.0

NOSC LA POSTA

2.0 CM

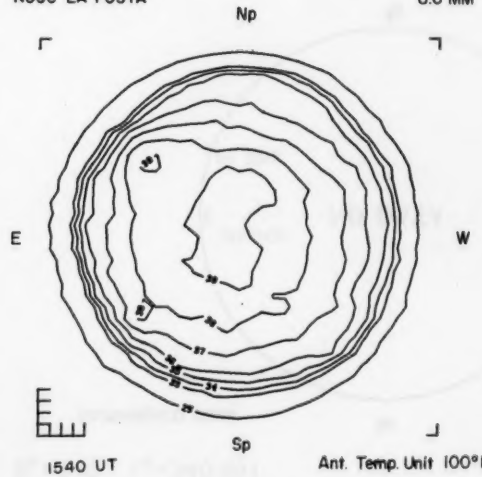


1636 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

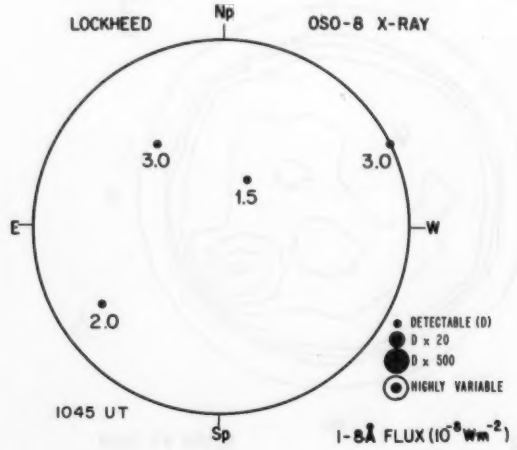
8.6 MM

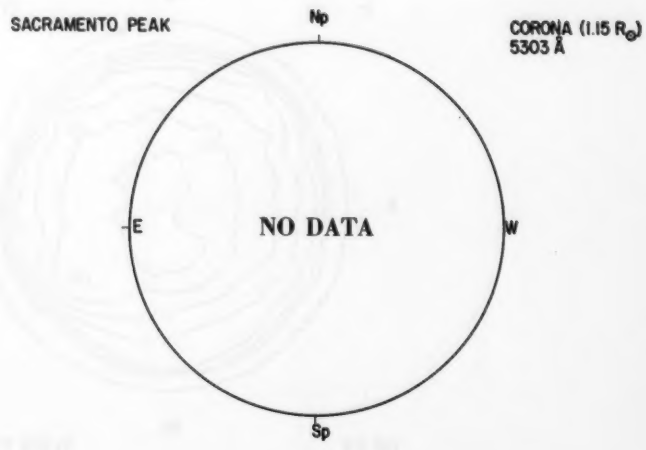


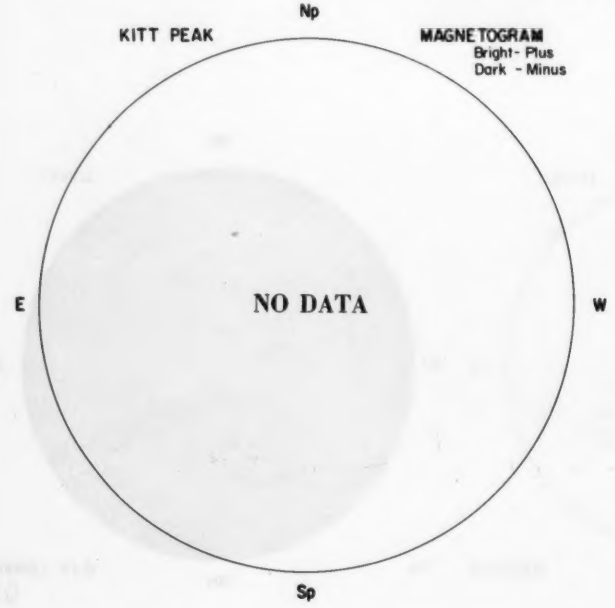
1540 UT

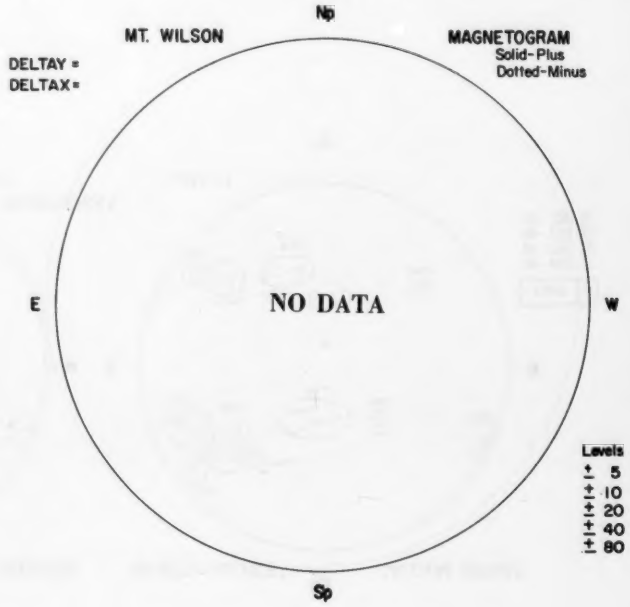
Ant. Temp. Unit 100°K

AUGUST 16, 1977 (P = 16.32, B_0 = 6.70, L_0 = 240.59)



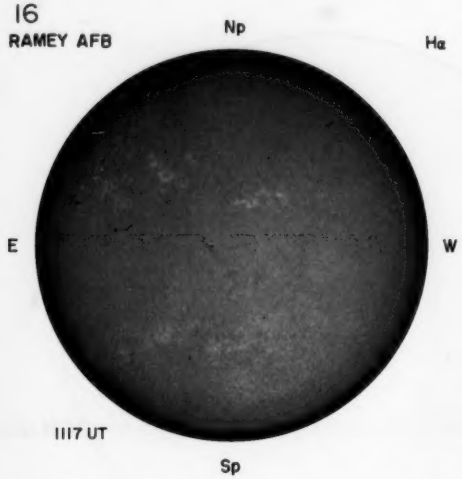




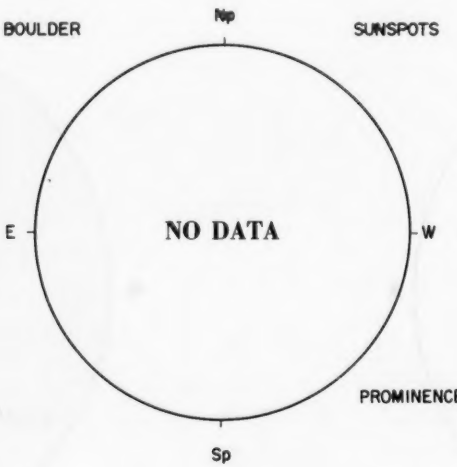


16

RAMEY AFB



Hα BOULDER

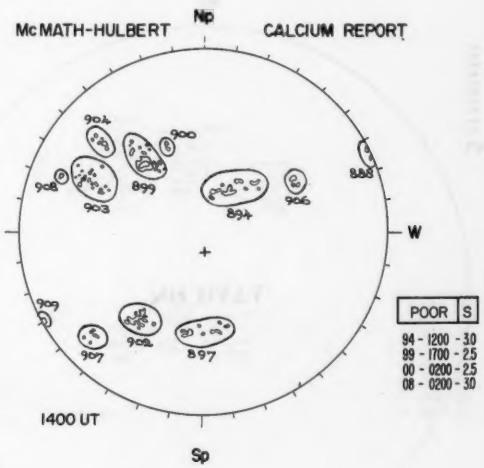


SUNSPOTS

PROMINENCES

McMATH-HULBERT

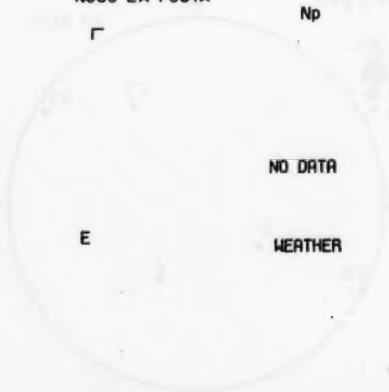
CALCIUM REPORT



POOR	S
94 - 1200 - 30	
99 - 1700 - 25	
00 - 0200 - 25	
08 - 0200 - 30	

NOSC LA POSTA

2.0 CM

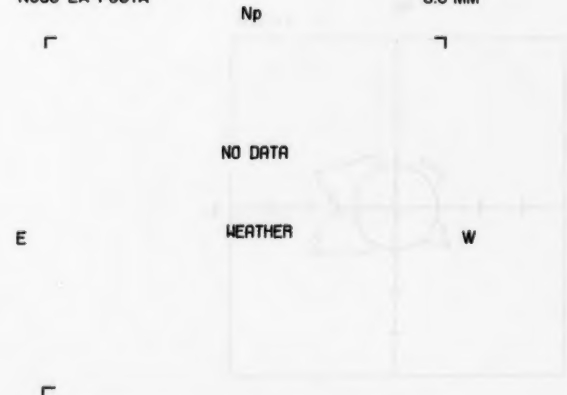


---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

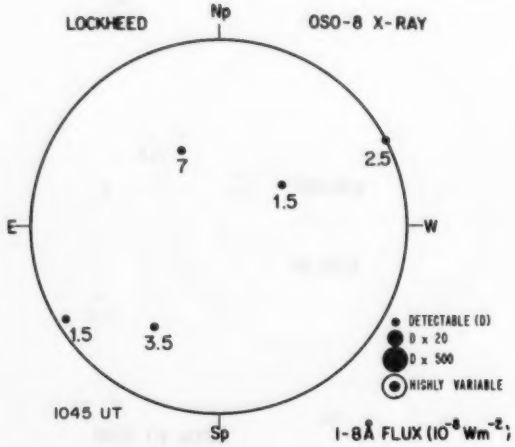


---- UT

Ant. Temp. Unit 100°K

AUGUST 17, 1977 (P = 16.66, B_o = 6.74, L_o = 227.37)

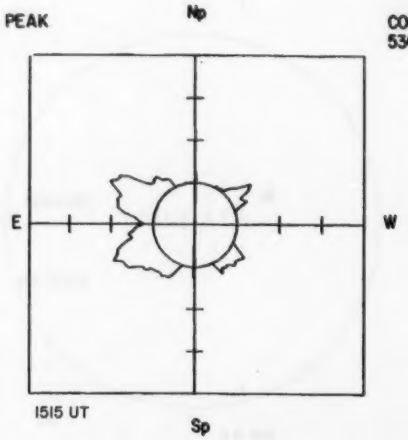
LOCKHEED OSO-8 X-RAY



1045 UT

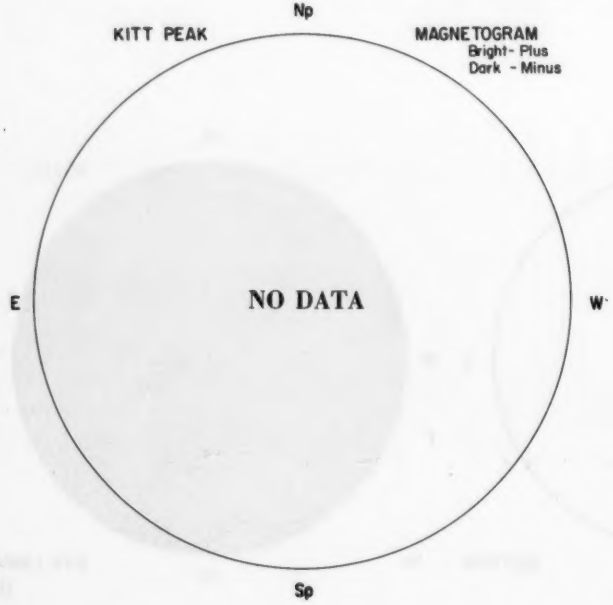
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



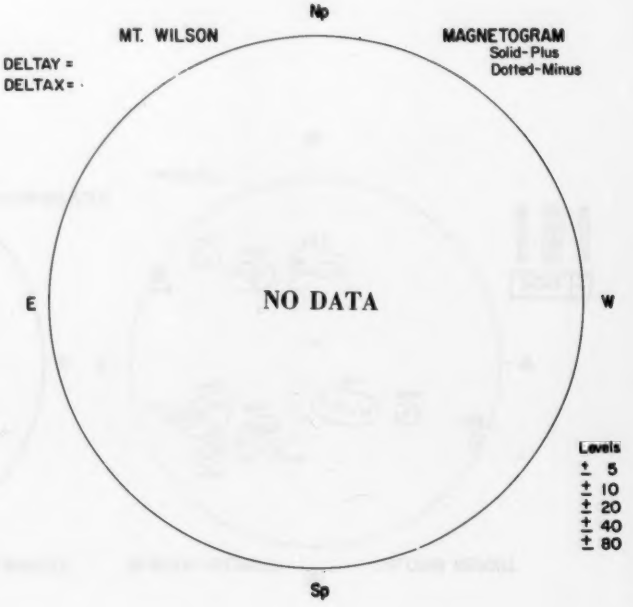
1515 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



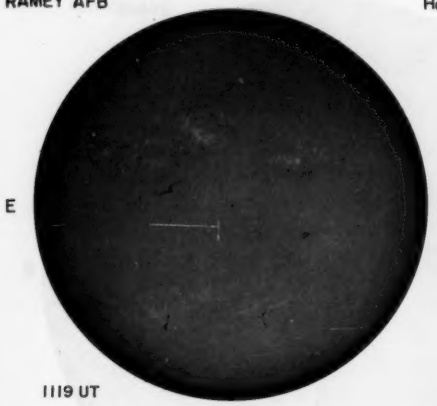
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

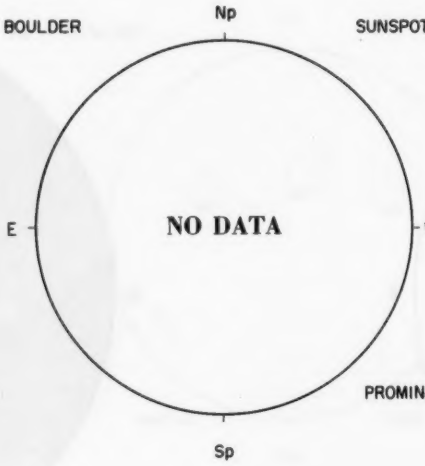


17

RAMEY AFB

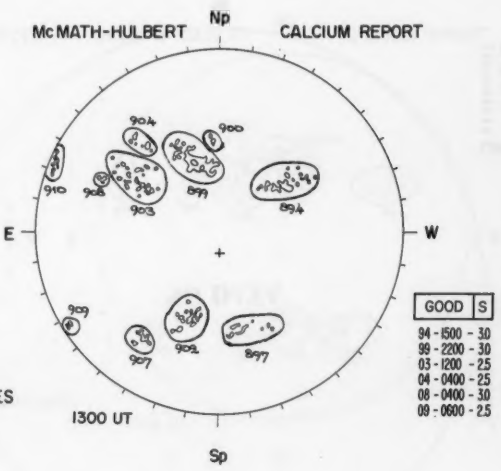


Hα BOULDER



SUNSPOTS

McMATH-HULBERT

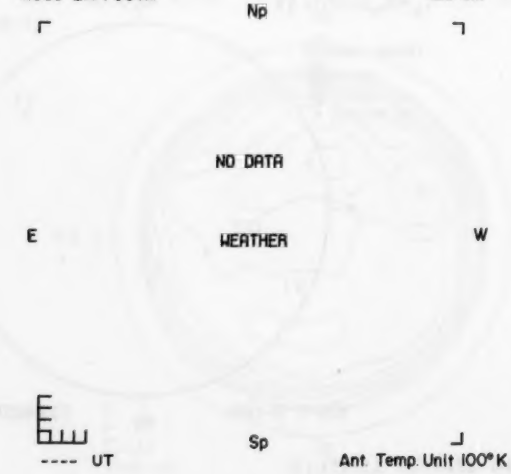


CALCIUM REPORT

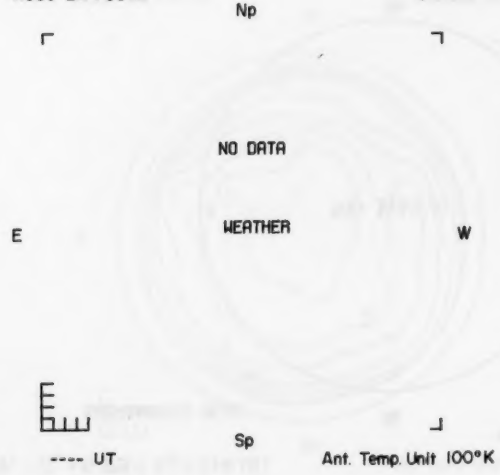
GOOD	S
94 - 1500	- 3.0
99 - 2200	- 3.0
03 - 1200	- 2.5
04 - 0400	- 2.5
08 - 0400	- 3.0
09 - 0600	- 2.5

PROMINENCES

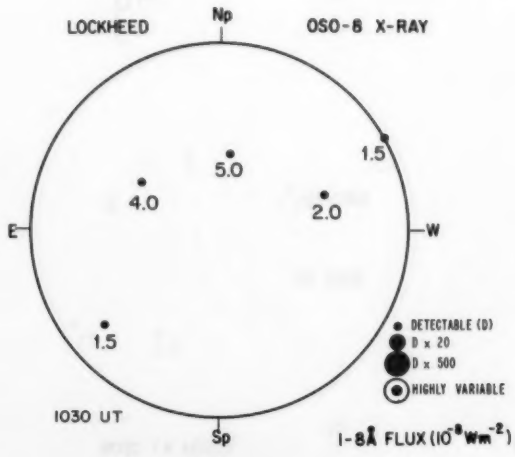
NOSC LA POSTA

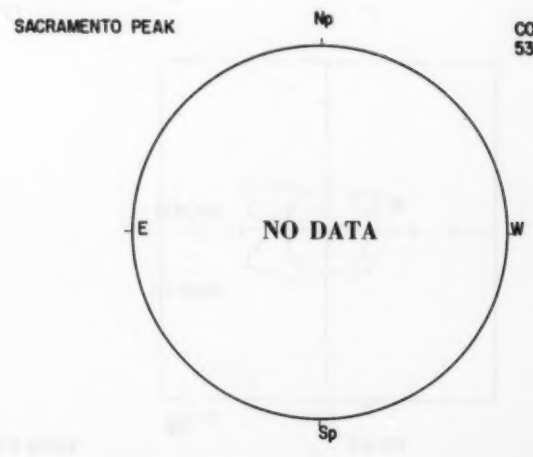


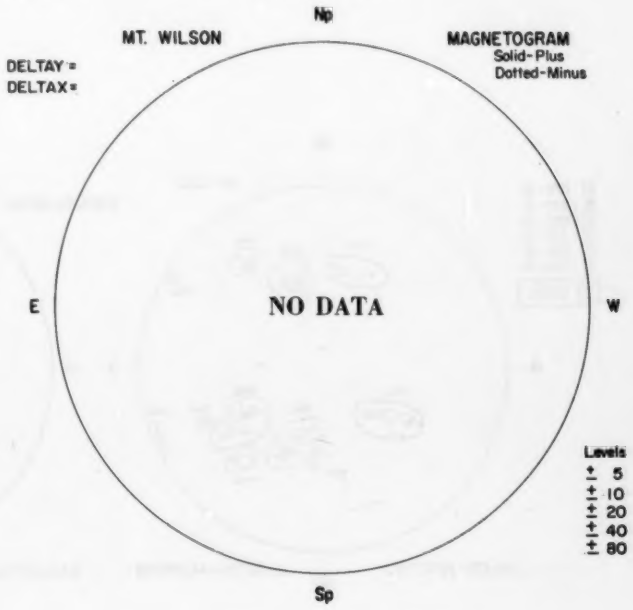
NOSC LA POSTA



AUGUST 18, 1977 (P = 16.99, B_o = 6.79, L_o = 214.16)

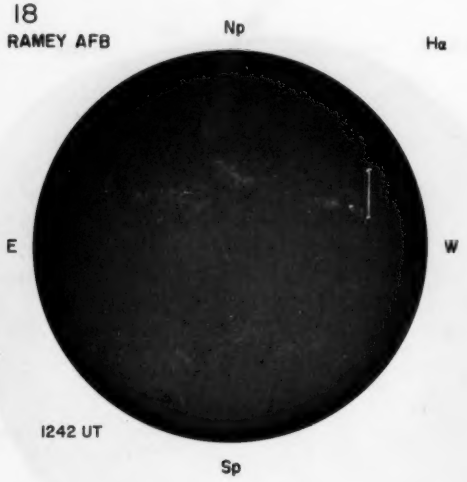




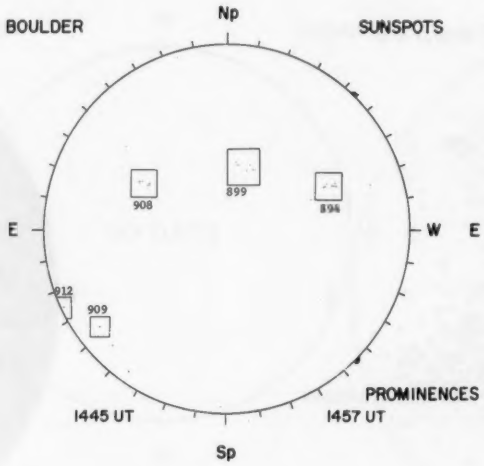


18

RAMEY AFB

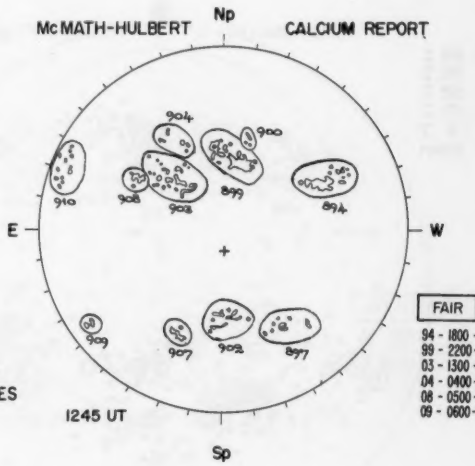


Hα BOULDER



SUNSPOTS

McMATH-HULBERT



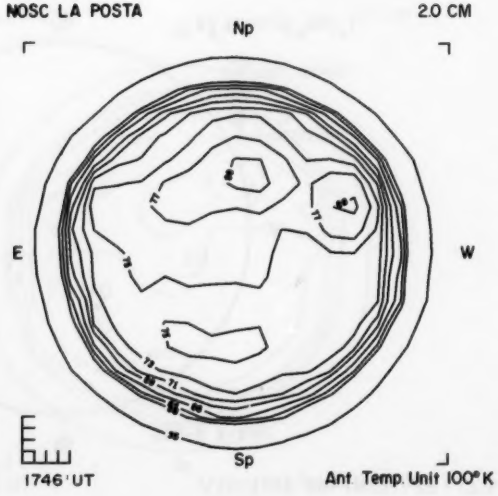
CALCIUM REPORT

PROMINENCES

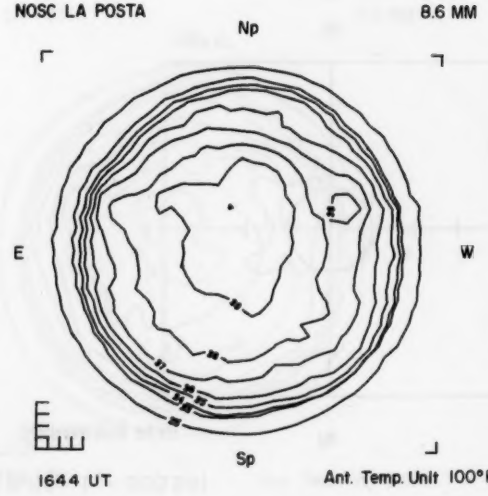
FAIR

94 - 1800 - 30
99 - 2200 - 30
03 - 1300 - 25
04 - 0400 - 25
08 - 0500 - 35
09 - 0600 - 25

NOSC LA POSTA 2.0 CM



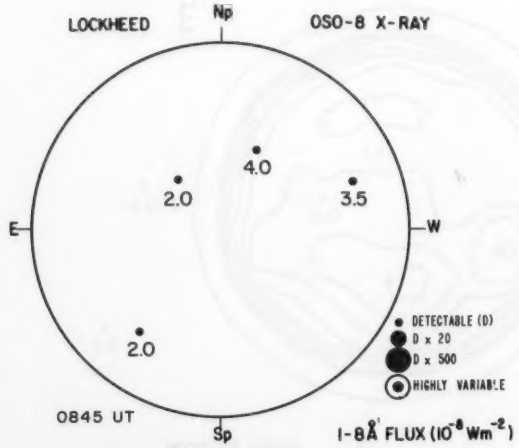
NOSC LA POSTA 8.6 MM



71
Aug 77

AUGUST 19, 1977 (P = 17.31, B_o = 6.83, L_o = 200.94)

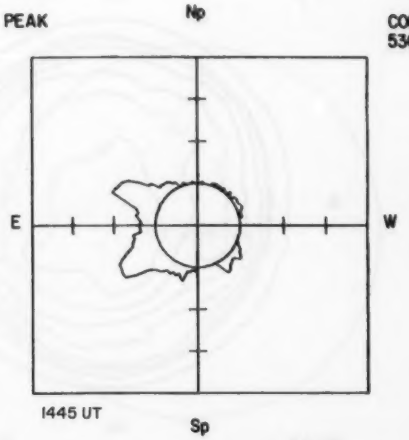
LOCKHEED OSO-8 X-RAY



0845 UT

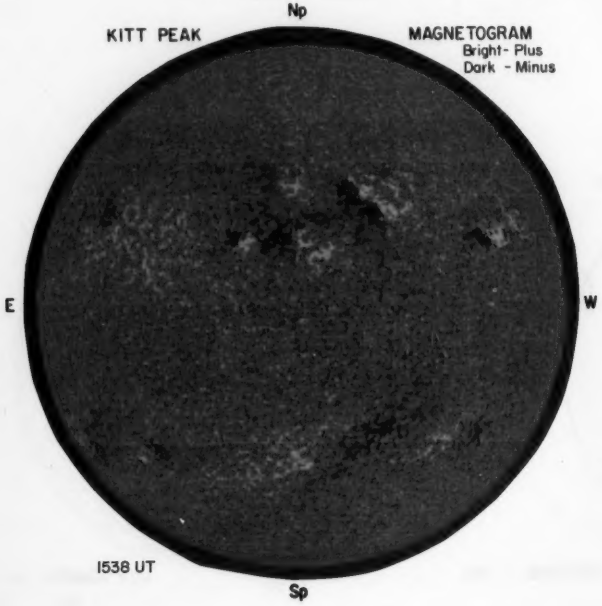
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK



1445 UT

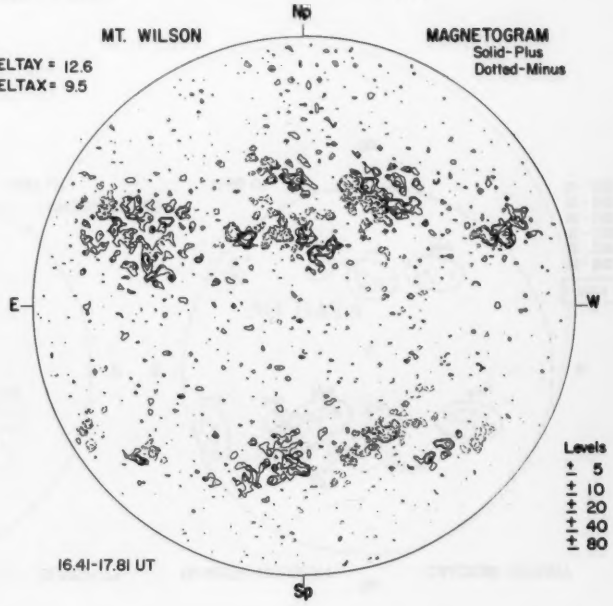
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1538 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

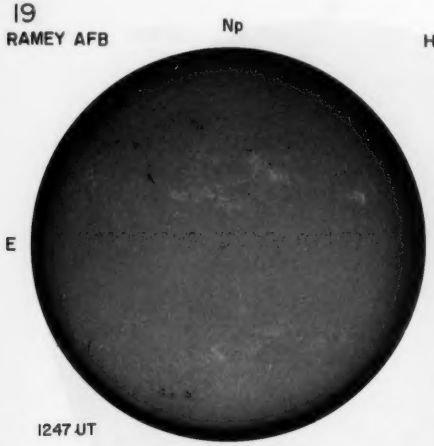
DELTAY = 12.6
DELTAX = 9.5



16.41-17.81 UT

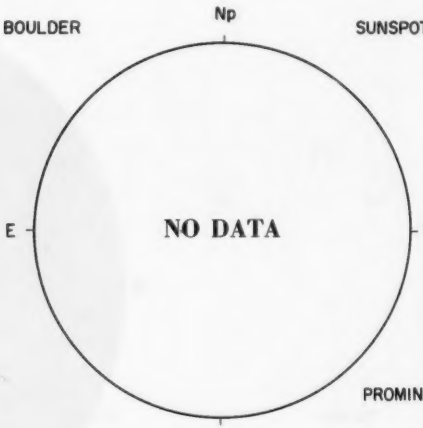
19

RAMEY AFB



1247 UT

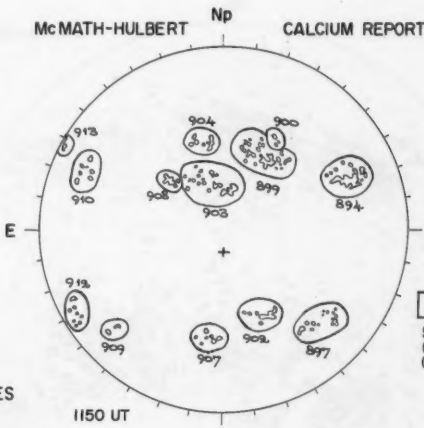
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



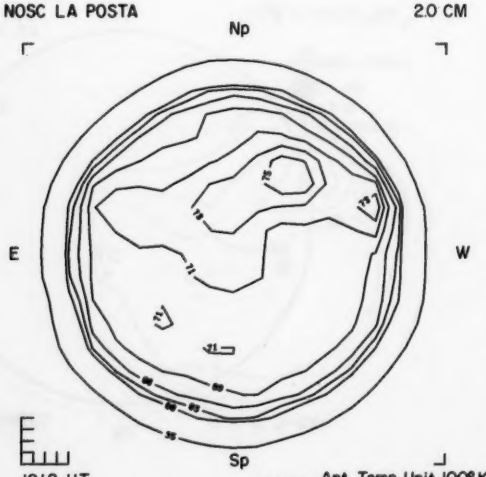
1150 UT

CALCIUM REPORT

GOOD	D

94 - 2000 - 30
03 - 1300 - 2.5
08 - 0600 - 30

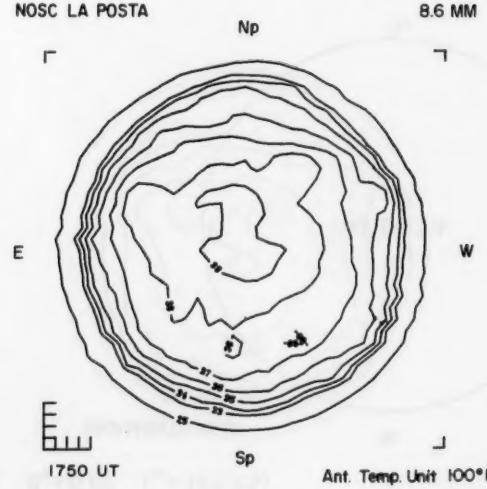
NOSC LA POSTA 2.0 CM



1918 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



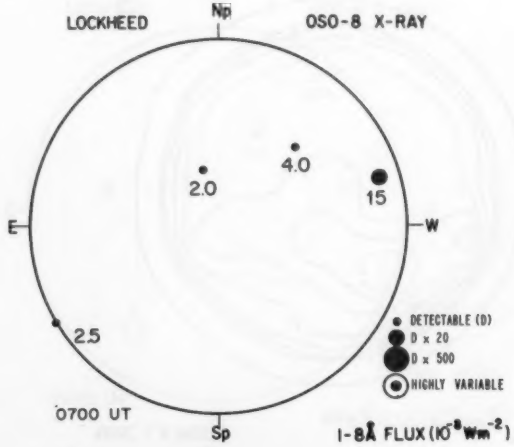
1750 UT

Ant. Temp. Unit 100°K

73
Aug 77

AUGUST 20, 1977 (P = 17.63, B_o = 6.87, L_o = 187.73)

LOCKHEED OSO-8 X-RAY

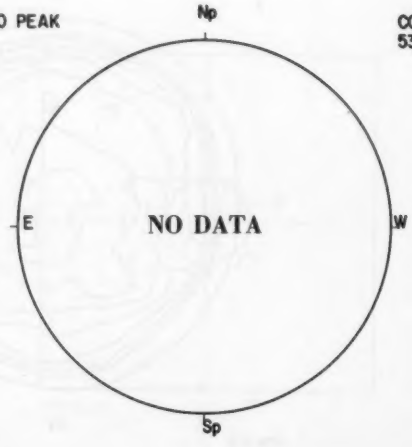


0700 UT

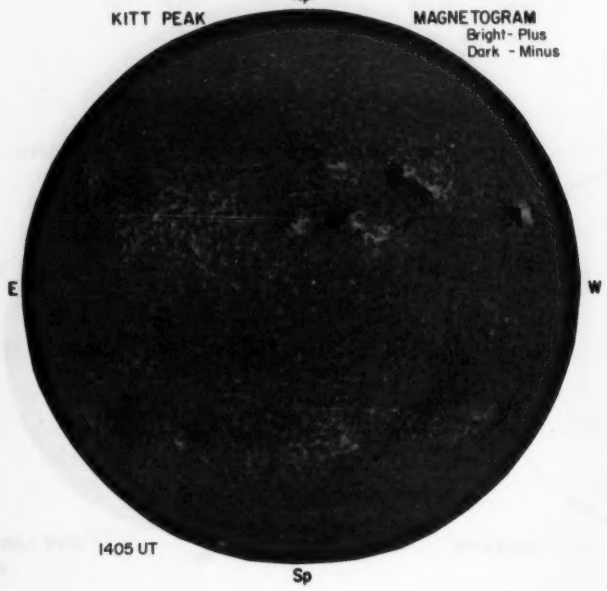
1-8Å FLUX ($K^{\circ}Wm^{-2}$)

SACRAMENTO PEAK

CORONA (1.15 $R_{\odot}$)
5303 Å



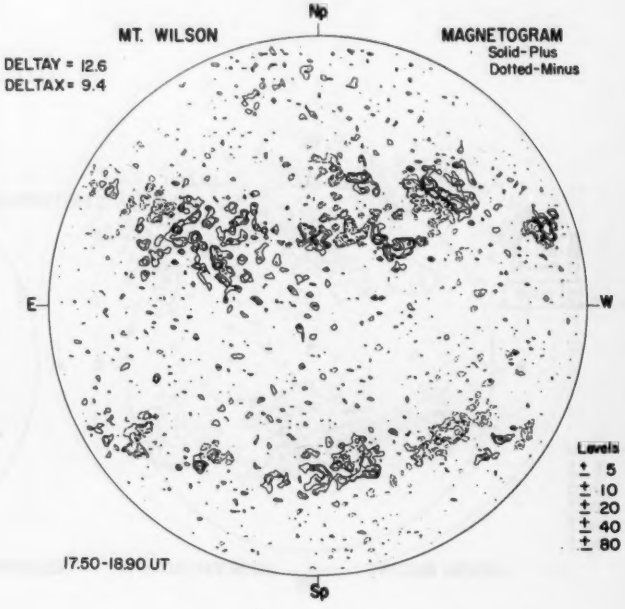
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1405 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

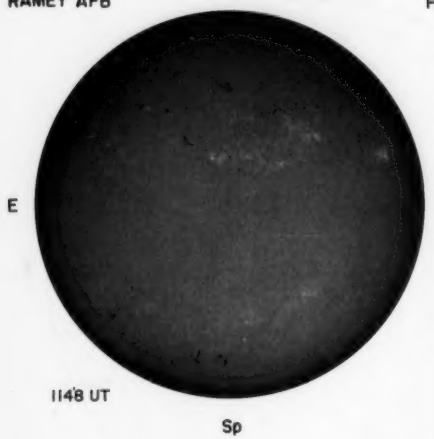
DELTAY = 12.6
DELTAX = 9.4



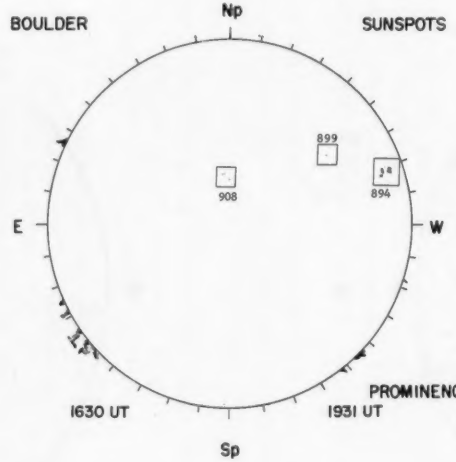
17.50-18.90 UT

20

RAMEY AFB



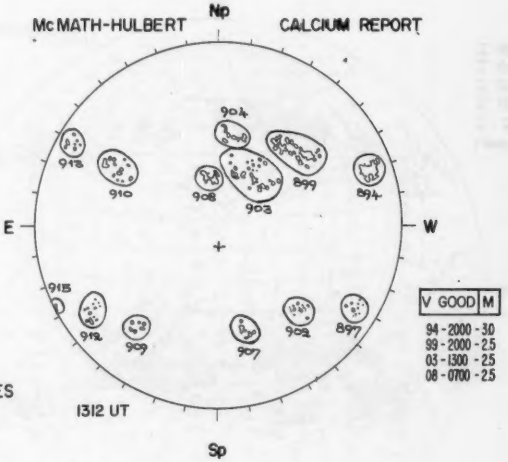
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

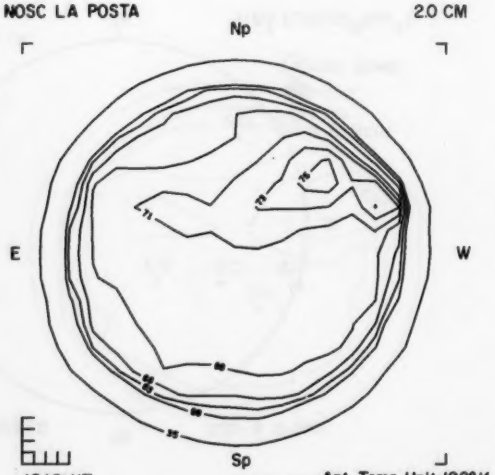
CALCIUM REPORT



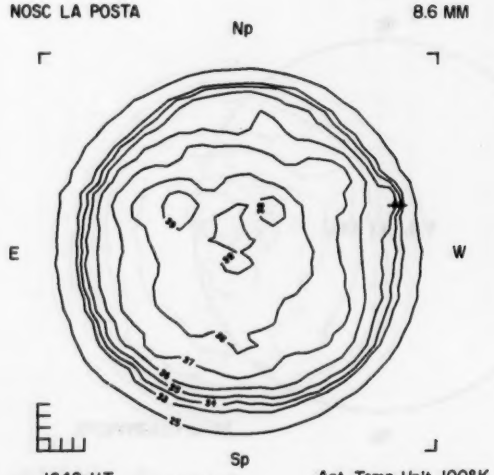
V	GOOD	M
94 - 2000 - 30		
99 - 2000 - 25		
03 - 1300 - 25		
08 - 0700 - 25		

PROMINENCES

NOSC LA POSTA 2.0 CM



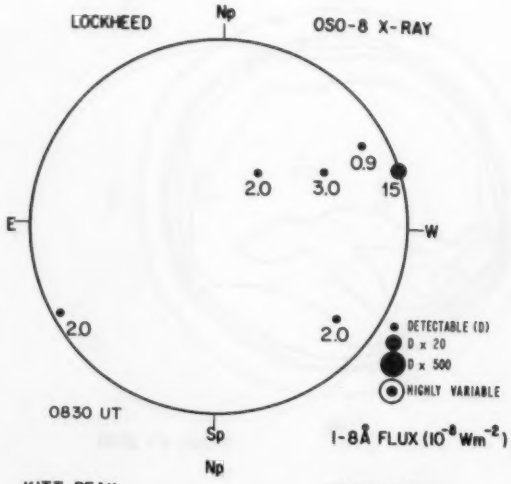
NOSC LA POSTA 8.6 MM



75
Aug 77

AUGUST 21, 1977 (P = 17.95, B_o = 6.91, L_o = 174.51)

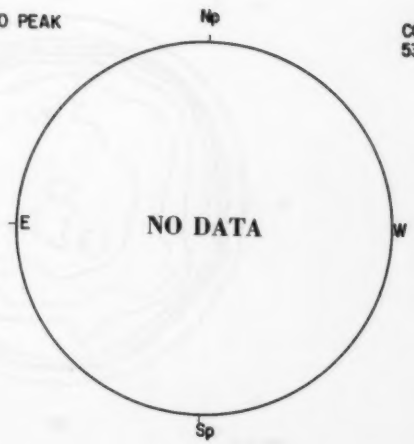
LOCKHEED OSO-8 X-RAY



1-8Å FLUX (10^{-8} Wm^{-2})

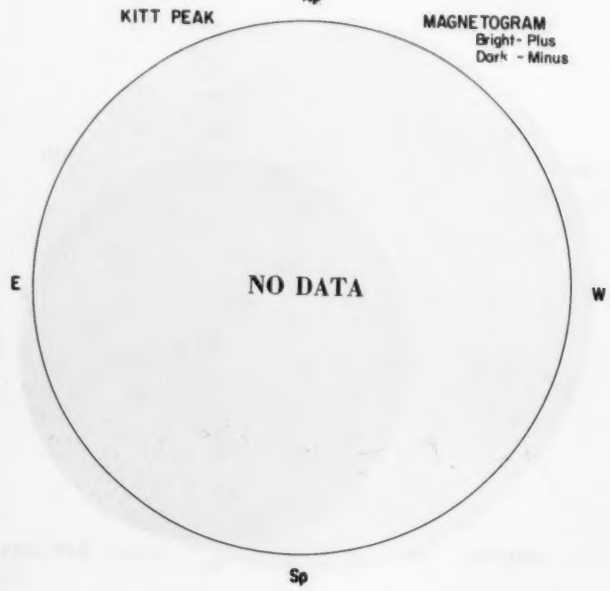
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

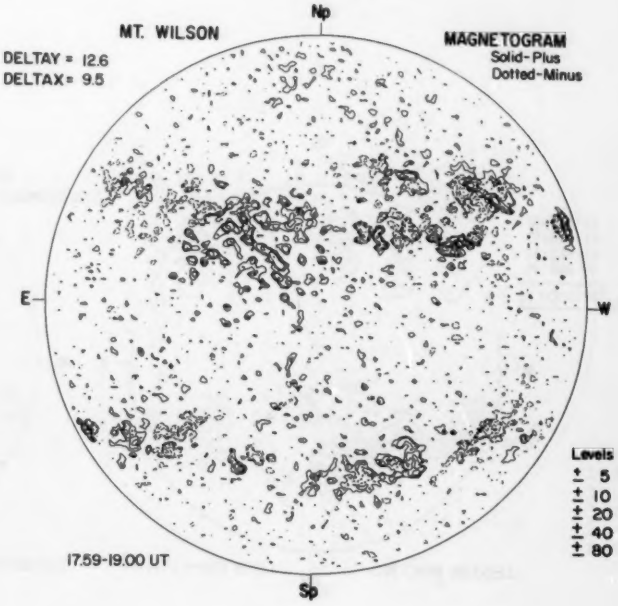
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

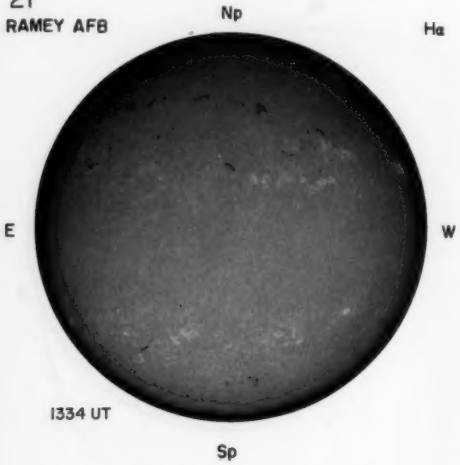
DELTAY = 12.6
DELTAX = 9.5

MAGNETOGRAM
Solid - Plus
Dotted - Minus



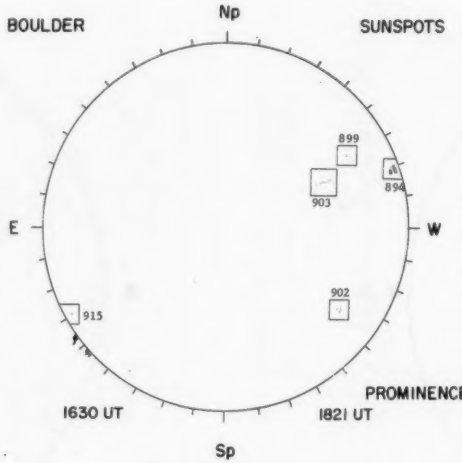
17.59-19.00 UT

RAMEY AFB



1334 UT

Hα BOULDER

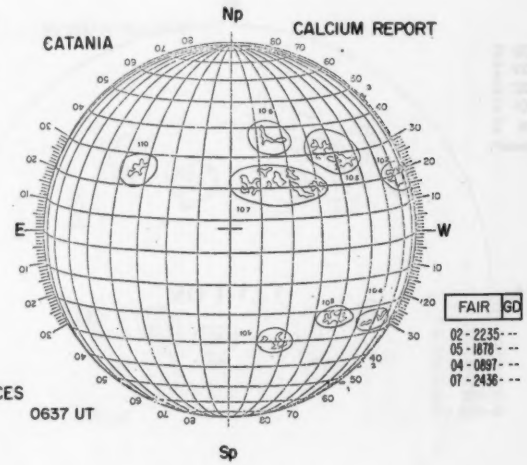


1630 UT

SUNSPOTS

1821 UT

CATANIA CALCIUM REPORT

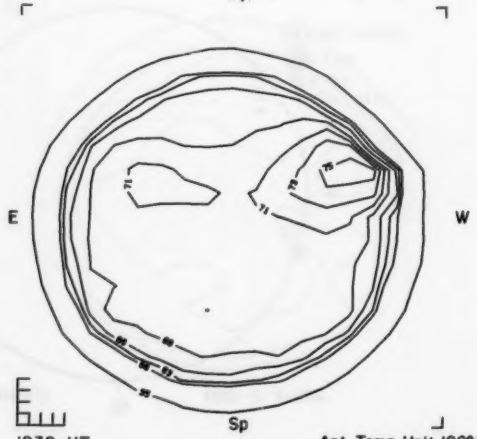


0637 UT

PROMINENCES

	FAIR	GD
02 - 2235	---	
05 - 1878	---	
04 - 0897	---	
07 - 2436	---	

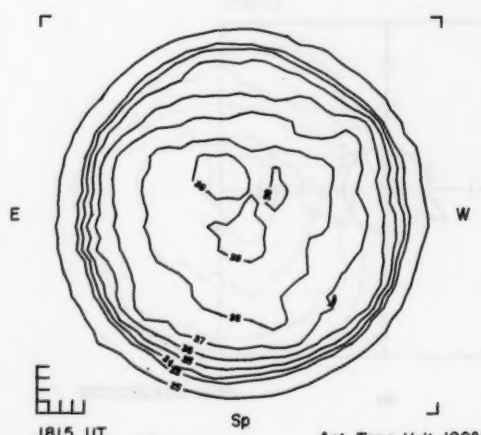
NOSC LA POSTA 2.0 CM



1939 UT

Ant Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



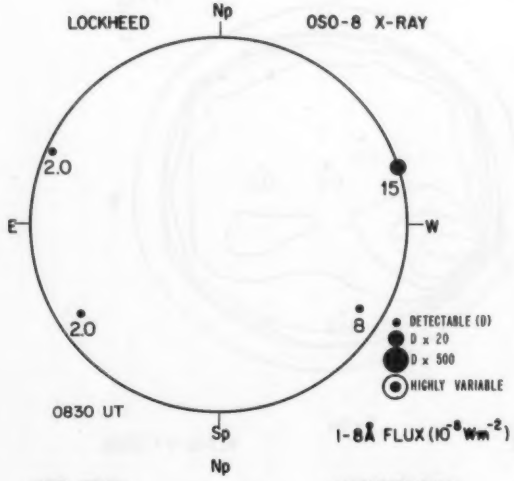
1815 UT

Ant. Temp. Unit 100°K

77 Aug 77

AUGUST 22, 1977 (P = 18.26, B_o = 6.94, L_o = 161.30)

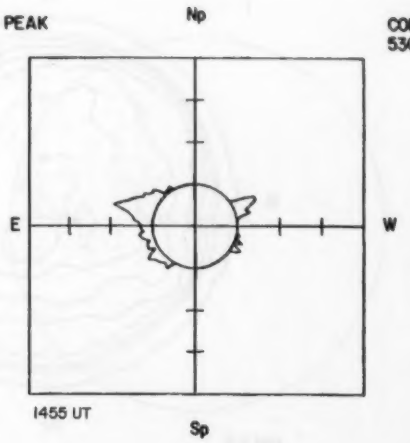
LOCKHEED OSO-8 X-RAY



0830 UT

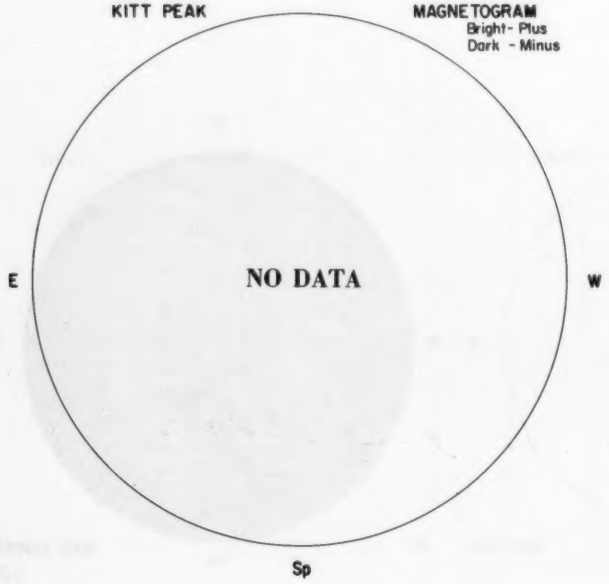
1-8Å FLUX (10^{-8} wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



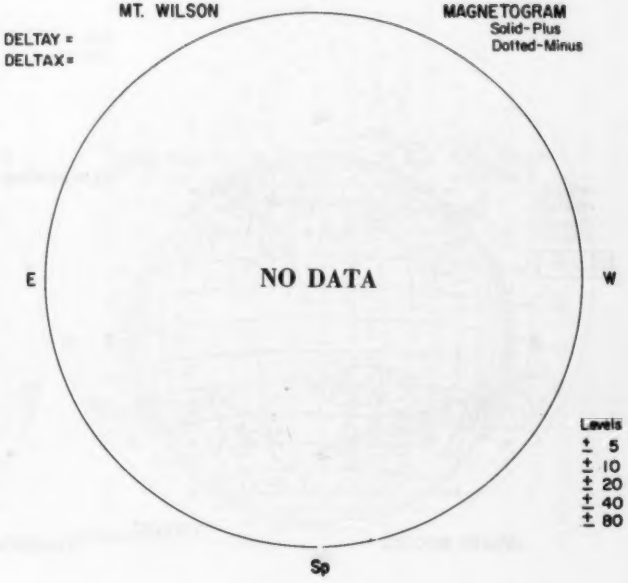
1455 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



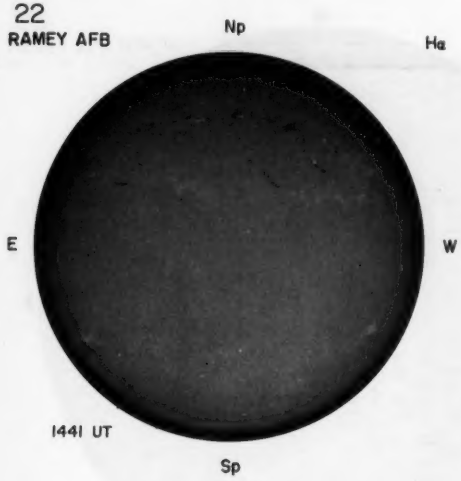
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



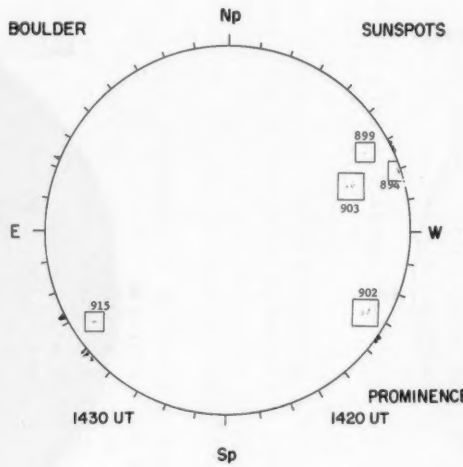
22

RAMEY AFB



1441 UT

Hα BOULDER



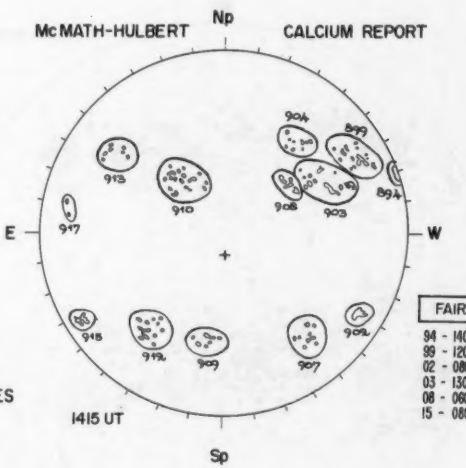
1430 UT

SUNSPOTS

PROMINENCES

1420 UT

McMATH-HULBERT



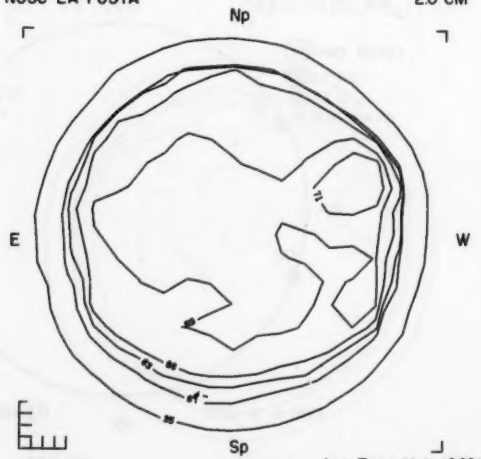
1415 UT

CALCIUM REPORT

FAIR	D

94 - 1400 - 2.5
99 - 1200 - 2.5
02 - 0800 - 3.5
03 - 1300 - 2.5
08 - 0600 - 2.5
15 - 0800 - 3.0

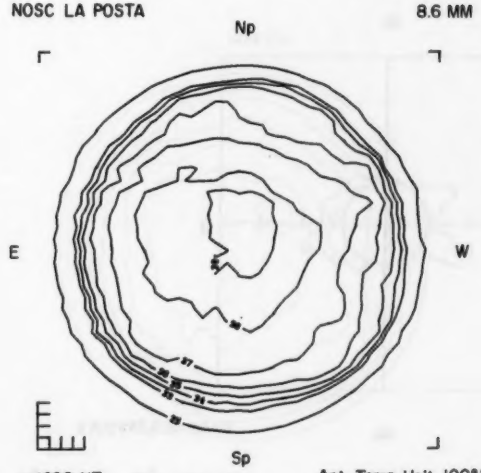
NOSC LA POSTA 2.0 CM



1801 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



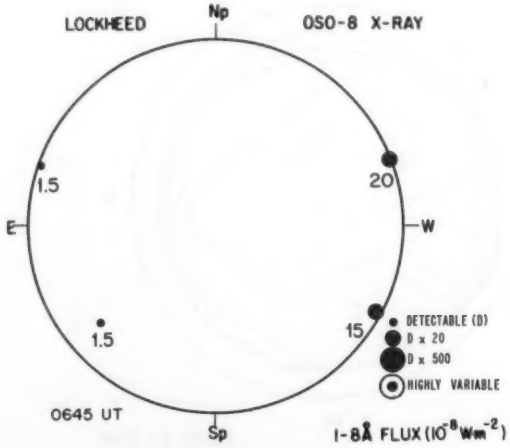
1608 UT

Ant. Temp. Unit 100°K

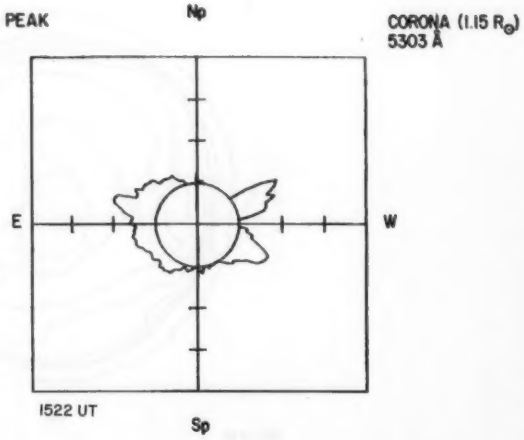
79
Aug 77

AUGUST 23, 1977 (P = 18.56, B_o = 6.98, L_o = 148.08)

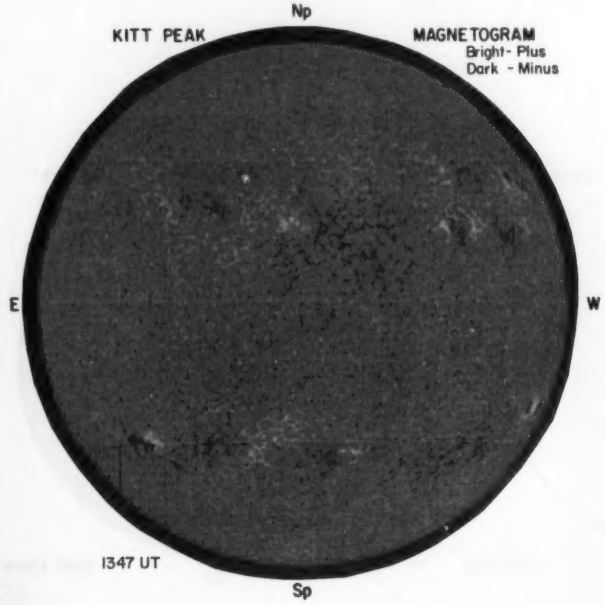
LOCKHEED OSO-8 X-RAY



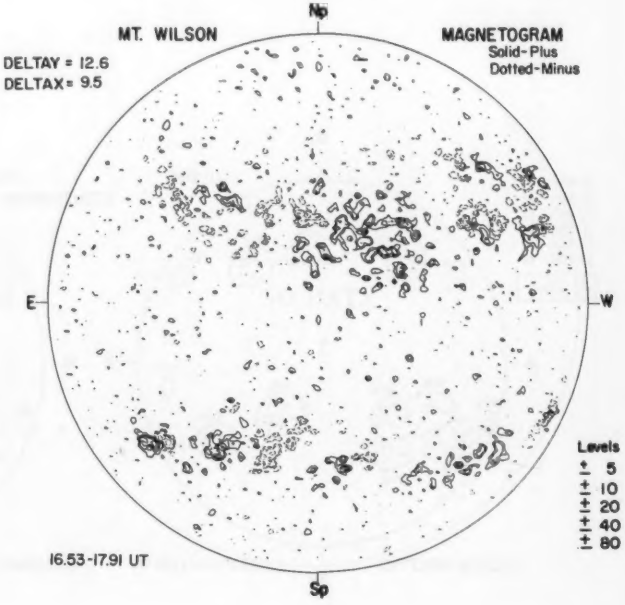
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright- Plus
Dark - Minus

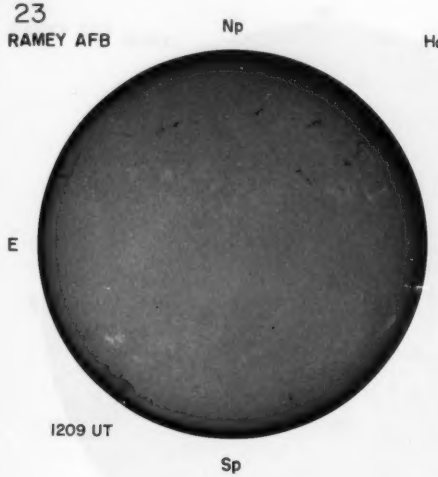


MT. WILSON MAGNETOGRAM
Solid- Plus
Dotted- Minus
DELTAY = 12.6
DELTAX = 9.5



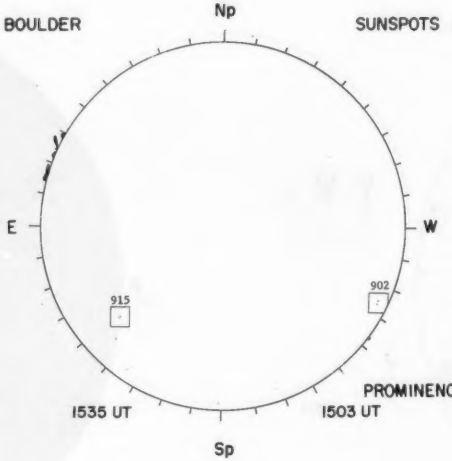
23

RAMEY AFB



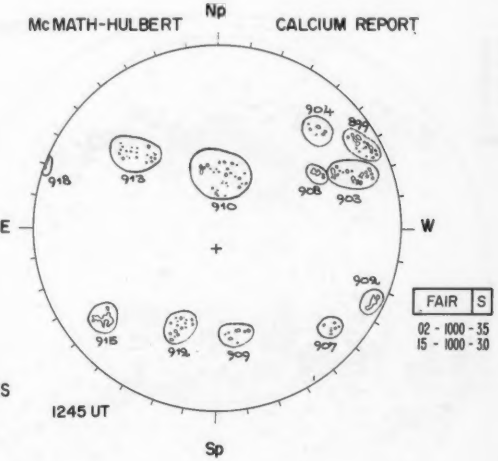
1209 UT

Hα BOULDER



1535 UT

SUNSPOTS



McMATH-HULBERT 1503 UT

PROMINENCES

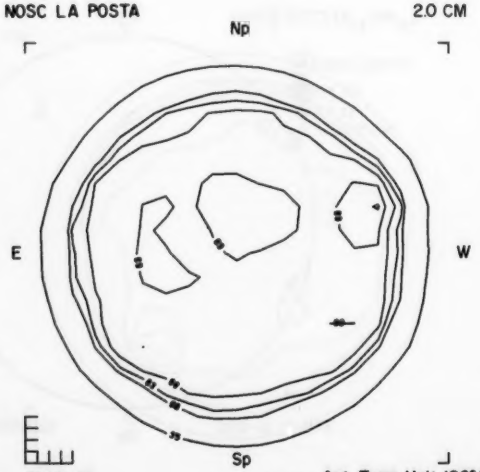
1245 UT

CALCIUM REPORT

FAIR	S

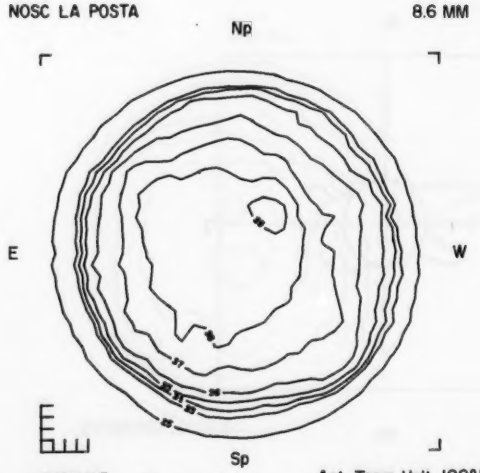
02 - 1000 - 35
15 - 1000 - 30

NOSC LA POSTA 2.0 CM



1641 UT Ant. Temp. Unit 100°K

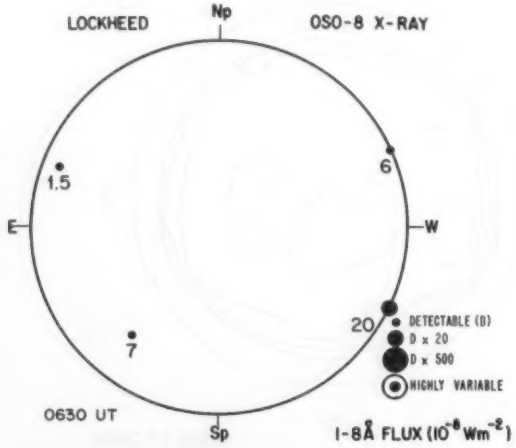
NOSC LA POSTA 8.6 MM



1538 UT Ant. Temp. Unit 100°K

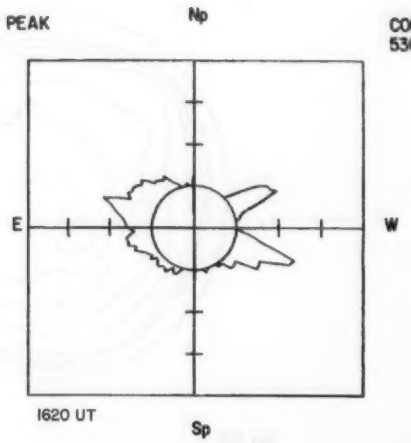
AUGUST 24, 1977 (P = 18.86, B_0 = 7.01, L_0 = 134.87)

LOCKHEED OSO-8 X-RAY

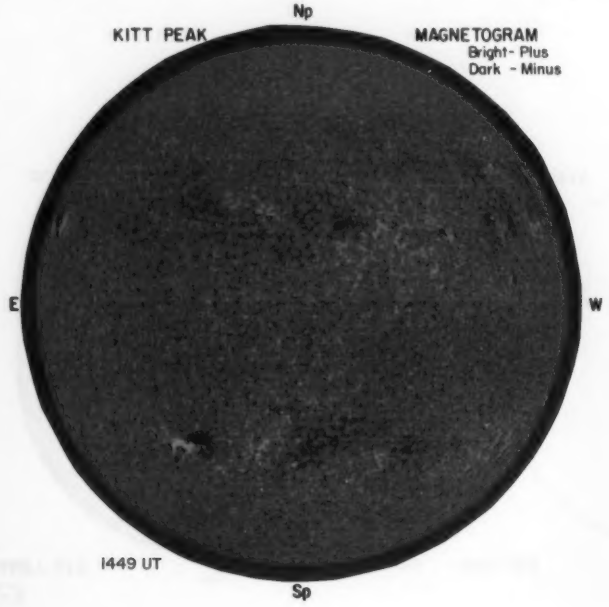


I-8Å FLUX (10^{-6} Wm^{-2})

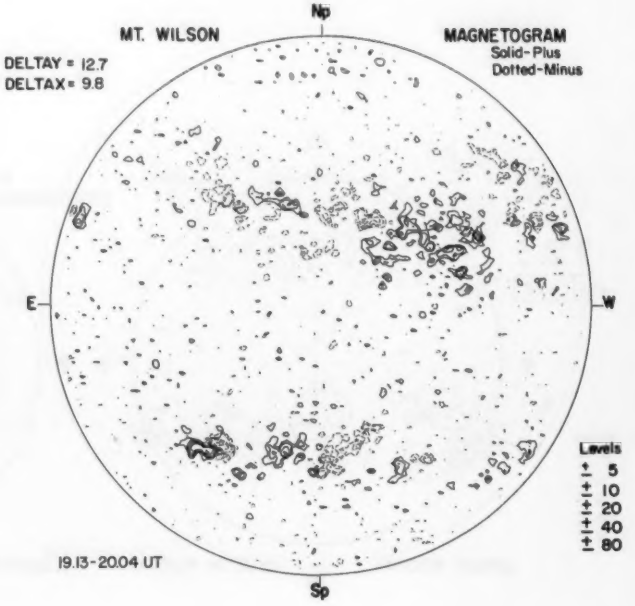
SACRAMENTO PEAK



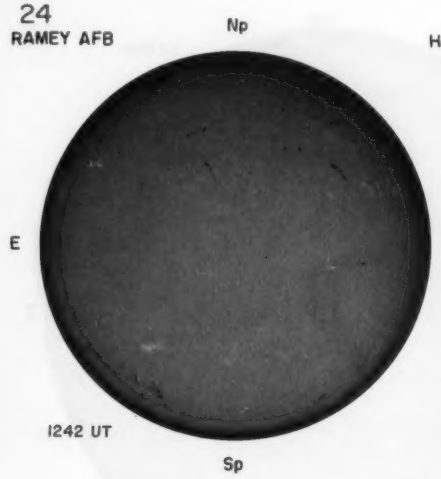
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



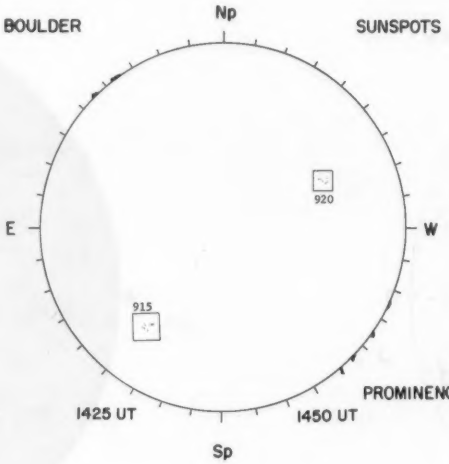
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.7
DELTAX = 9.8



RAMEY AFB



Hα BOULDER

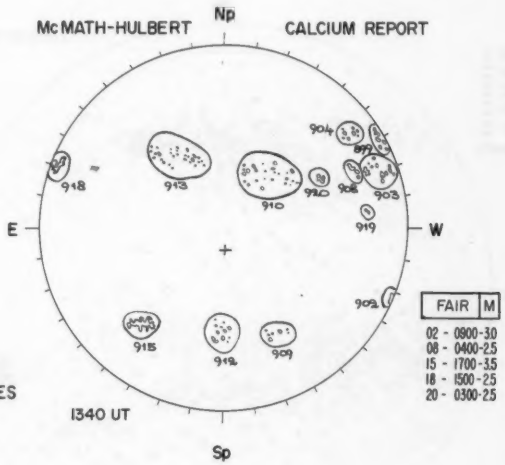


SUNSPOTS

PROMINENCES

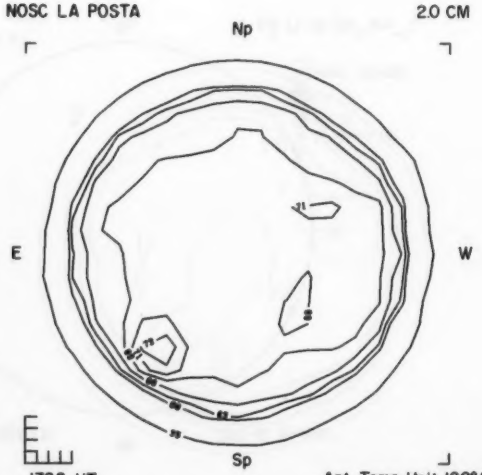
McMATH-HULBERT

CALCIUM REPORT

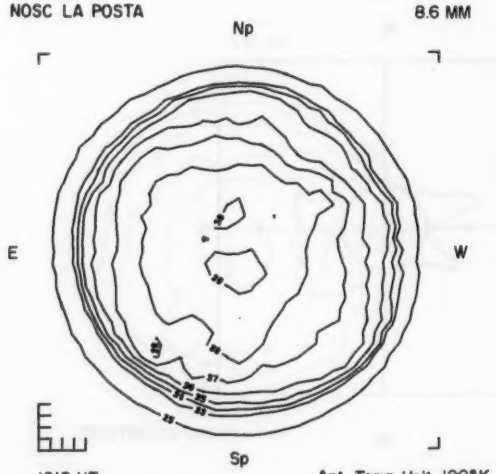


FAIR	M
02 - 0900-30	
08 - 0400-25	
15 - 1700-35	
18 - 1500-25	
20 - 0300-25	

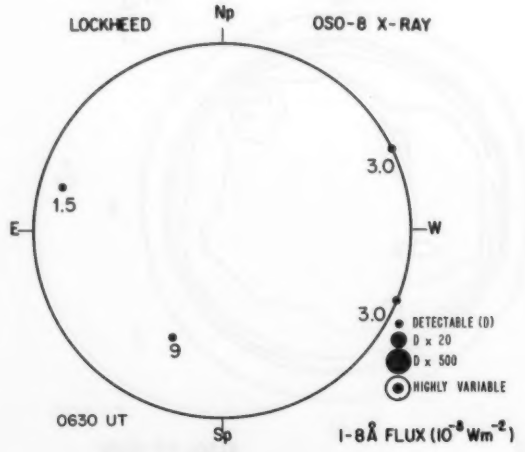
NOSC LA POSTA 2.0 CM

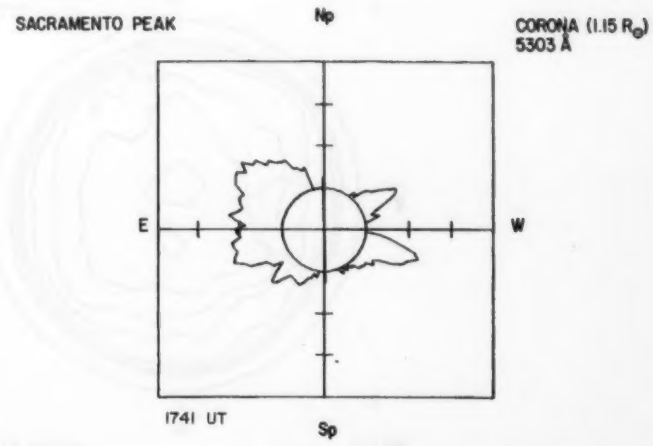


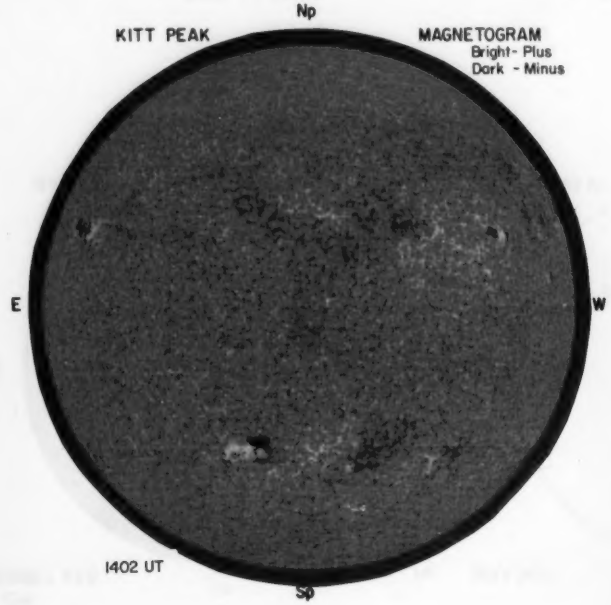
NOSC LA POSTA 8.6 MM

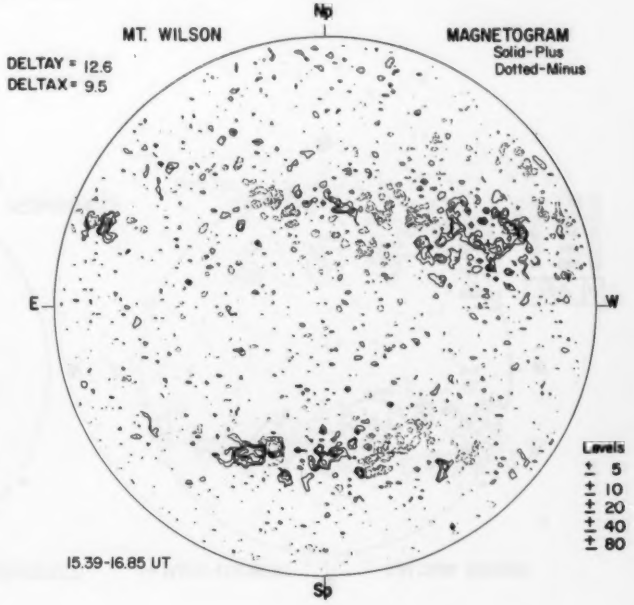


AUGUST 25, 1977 (P = 19.16, B_o = 7.04, L_o = 121.65)



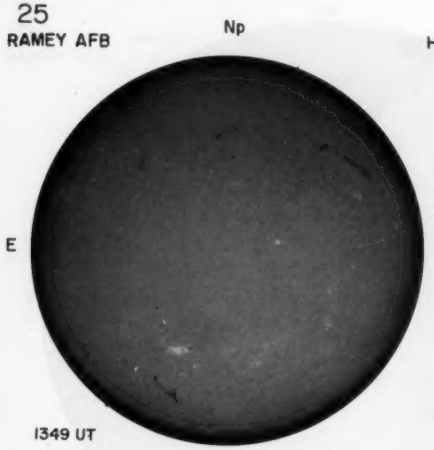




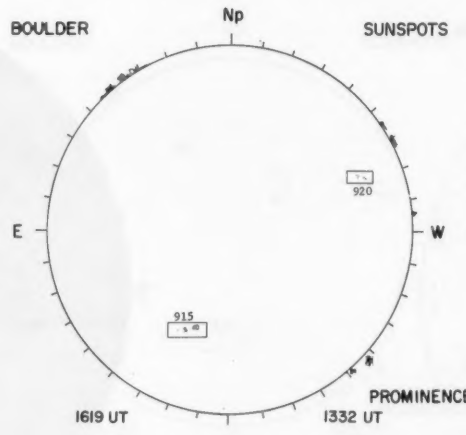


25

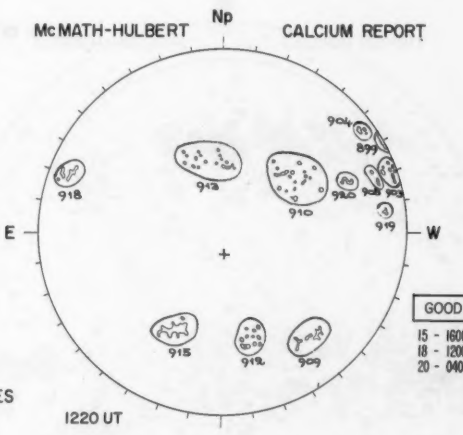
RAMEY AFB



Hα BOULDER



SUNSPOTS



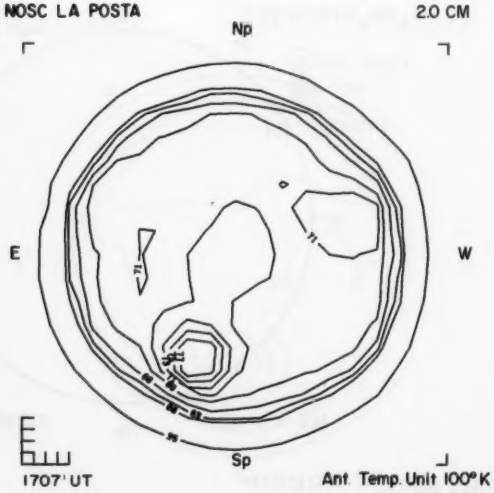
PROMINENCES

McMATH-HULBERT

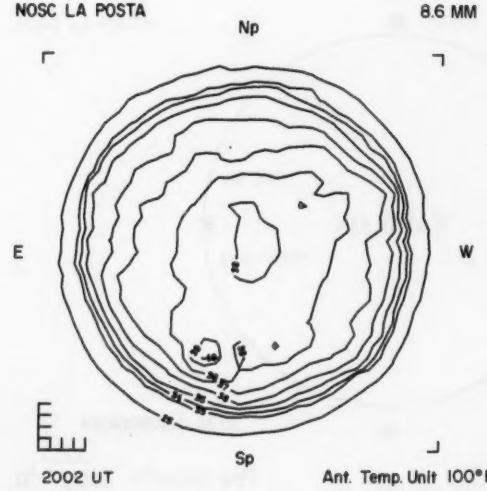
CALCIUM REPORT

GOOD	S
15 - 1600 - 3.5	
18 - 1200 - 2.5	
20 - 0400 - 3.5	

NOSC LA POSTA 2.0 CM



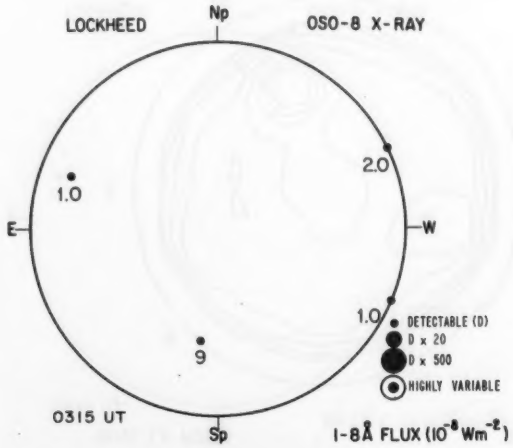
NOSC LA POSTA 8.6 MM



85
Aug 77

AUGUST 26, 1977 (P = 19.45, B_o = 7.07, L_o = 108.44)

LOCKHEED OSO-8 X-RAY

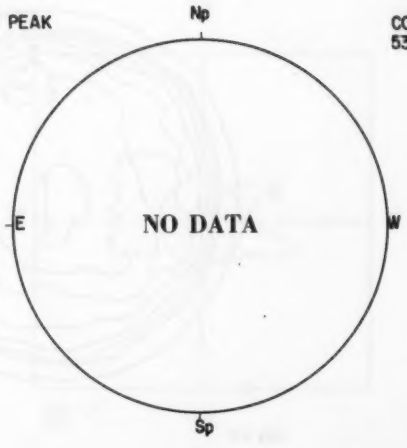


0315 UT

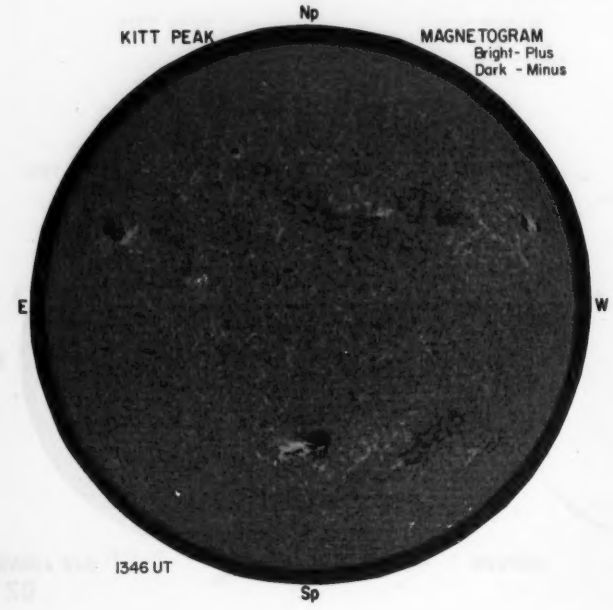
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



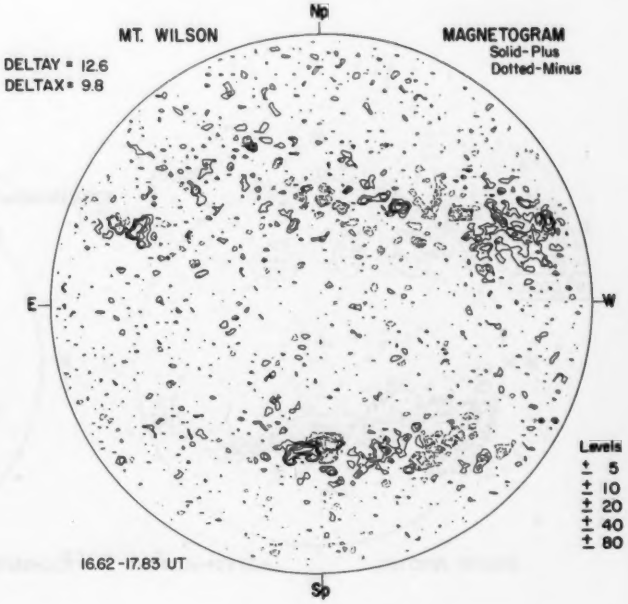
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1346 UT

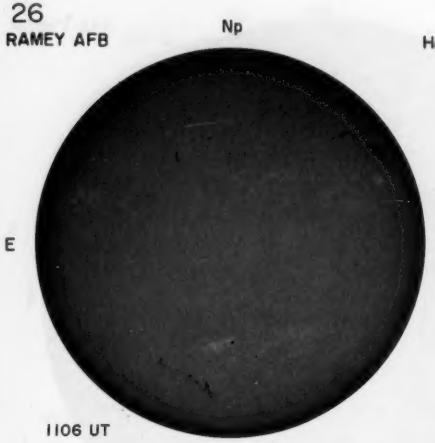
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.8



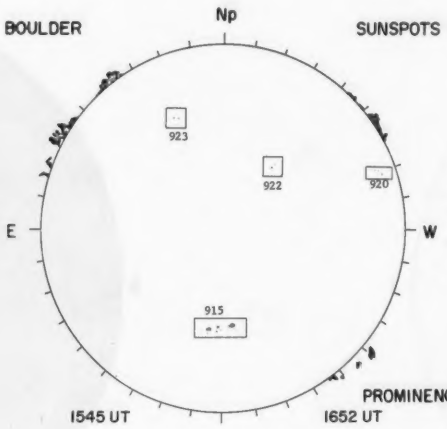
16.62 - 17.83 UT

RAMEY AFB



1106 UT

Hα BOULDER



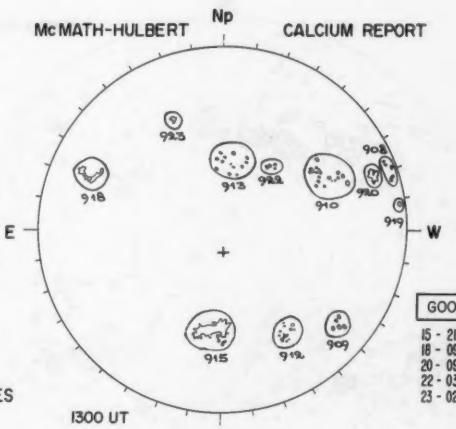
1545 UT

SUNSPOTS

PROMINENCES

1652 UT

McMATH-HULBERT



1300 UT

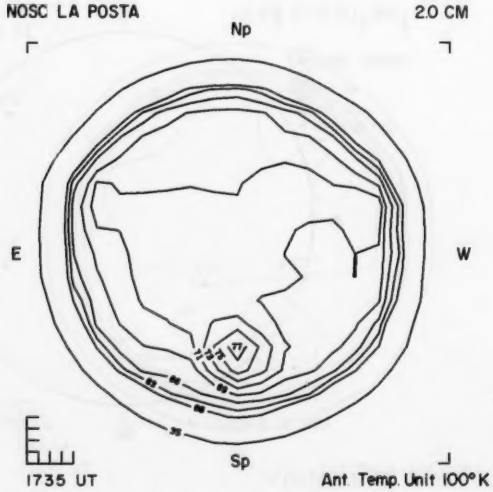
CALCIUM REPORT

GOOD	S

15 - 2100 - 30
18 - 0900 - 25
20 - 0900 - 25
22 - 0300 - 25
23 - 0200 - 25

NOSC LA POSTA

2.0 CM

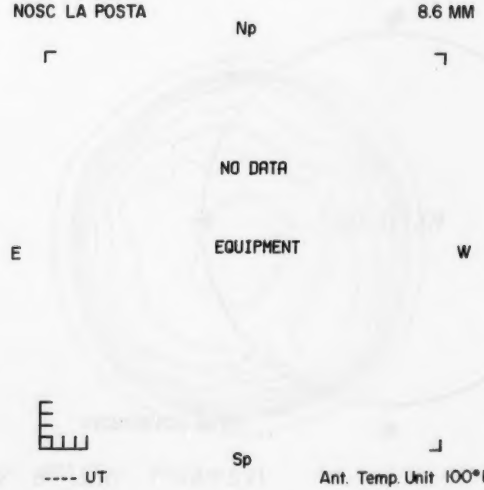


1735 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

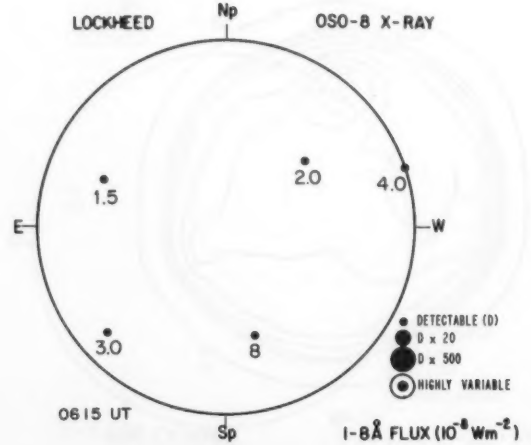
8.6 MM

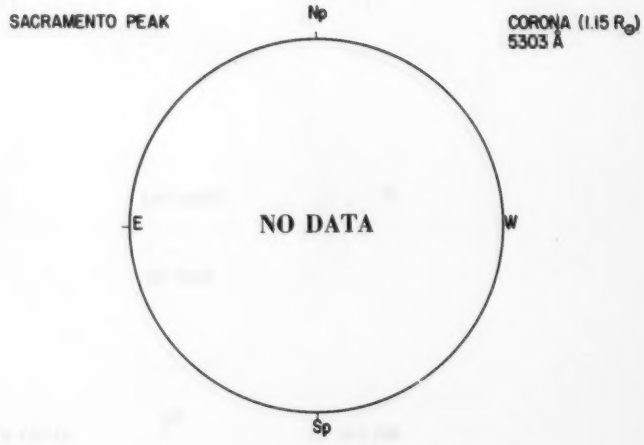


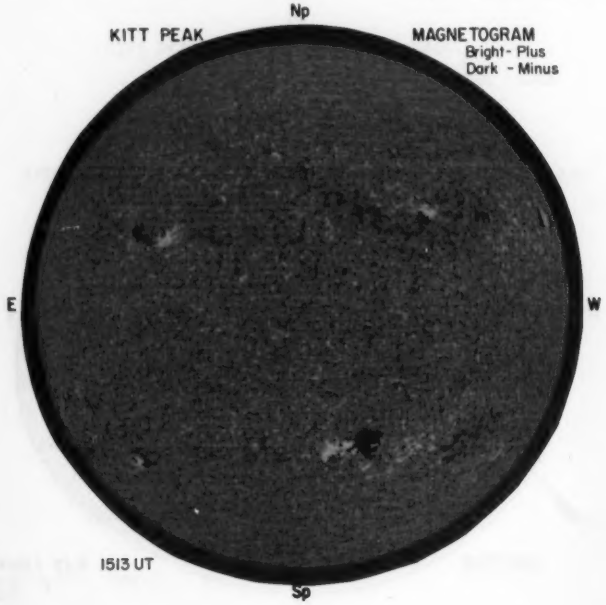
---- UT

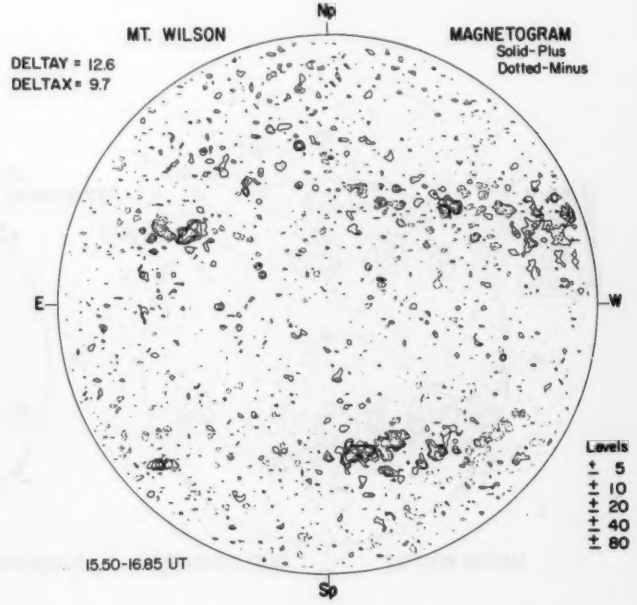
Ant. Temp. Unit 100°K

AUGUST 27, 1977 (P = 19.73, B_0 = 7.10, L_0 = 95.23)



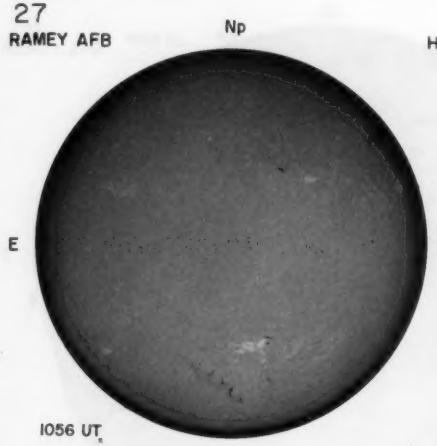






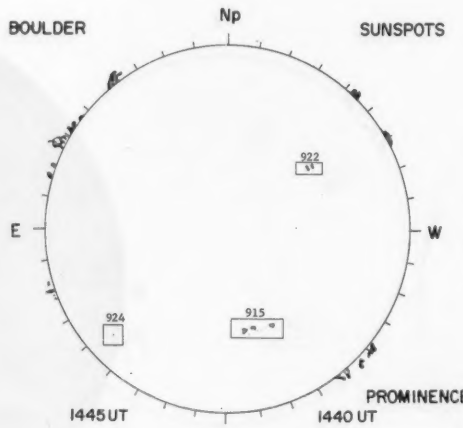
27

RAMEY AFB



1056 UT

Hα BOULDER



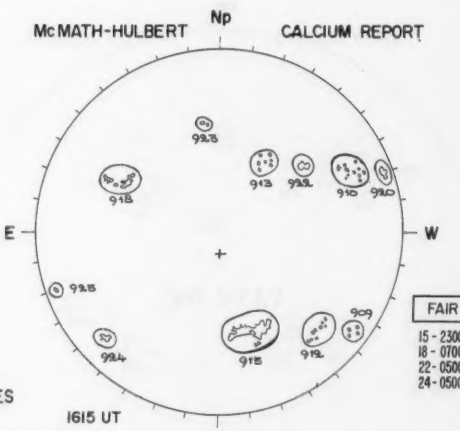
1445 UT

SUNSPOTS

1440 UT

PROMINENCES

McMATH-HULBERT

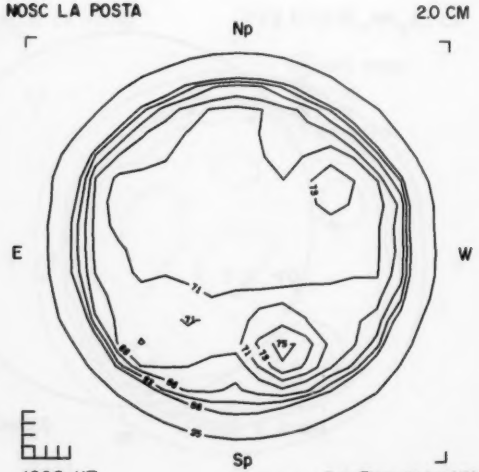


1615 UT

CALCIUM REPORT

FAIR	M
15 - 2300 - 3.0	
18 - 0700 - 2.5	
22 - 0500 - 3.5	
24 - 0500 - 3.5	

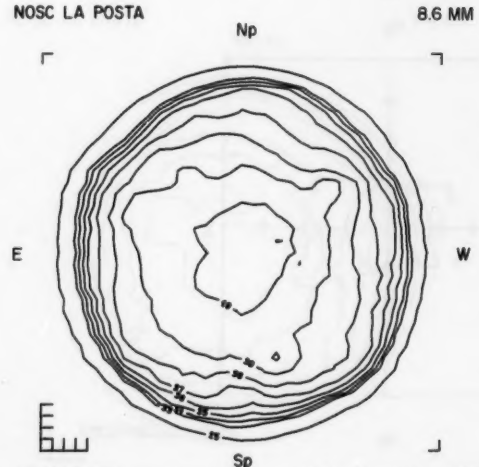
NOSC LA POSTA 2.0 CM



1808 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

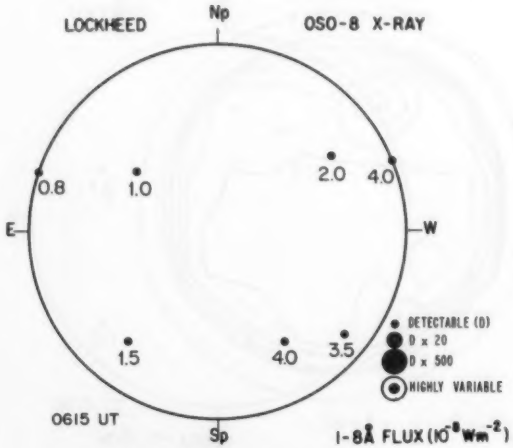


1657 UT

Ant. Temp. Unit 100°K

AUGUST 28, 1977 (P = 20.01, B_o = 7.12, L_o = 82.02)

LOCKHEED OSO-8 X-RAY

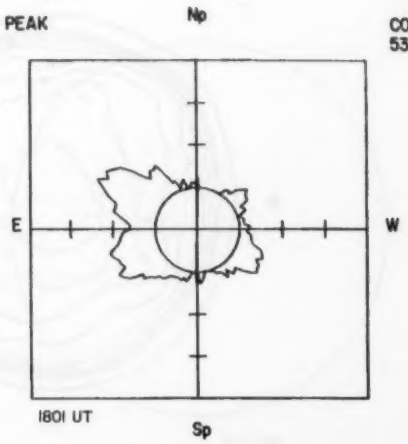


0615 UT

1-8Å FLUX (10^{-8} Wm^{-2})

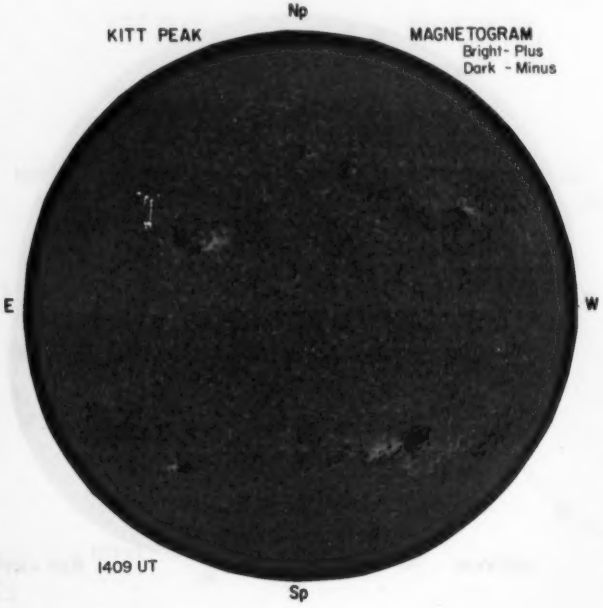
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1801 UT

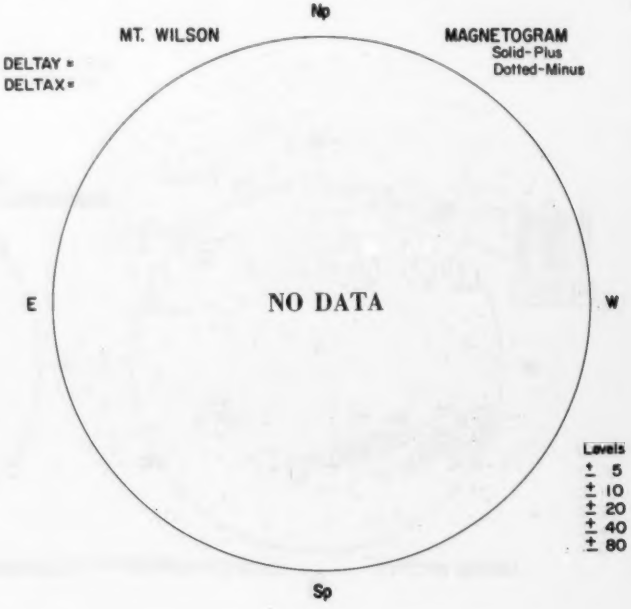
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1409 UT

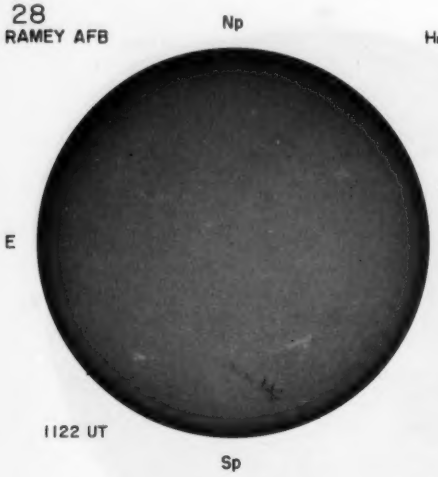
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

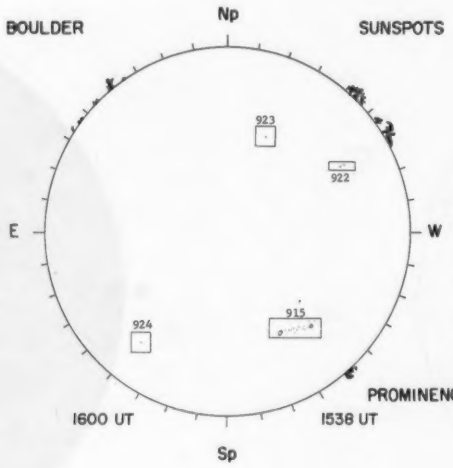


28

RAMEY AFB



Hα BOULDER

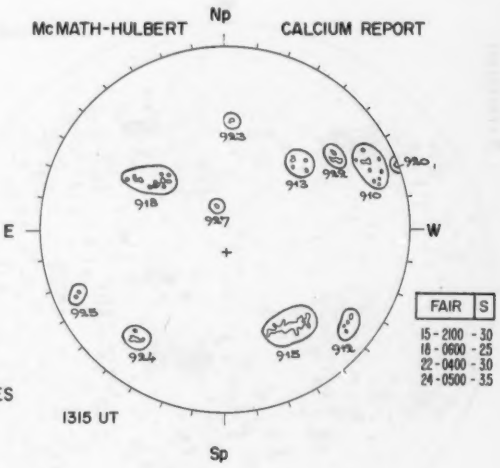


SUNSPOTS

PROMINENCES

1538 UT

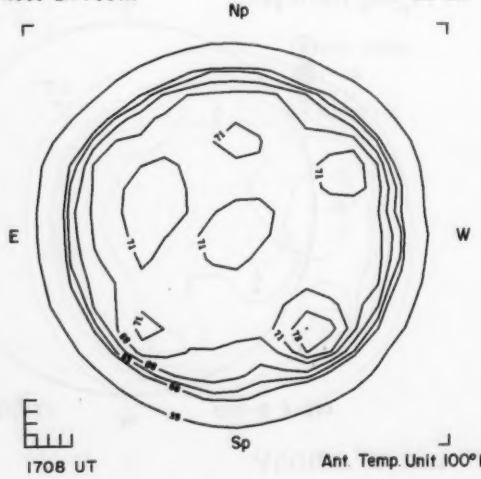
McMATH-HULBERT



CALCIUM REPORT

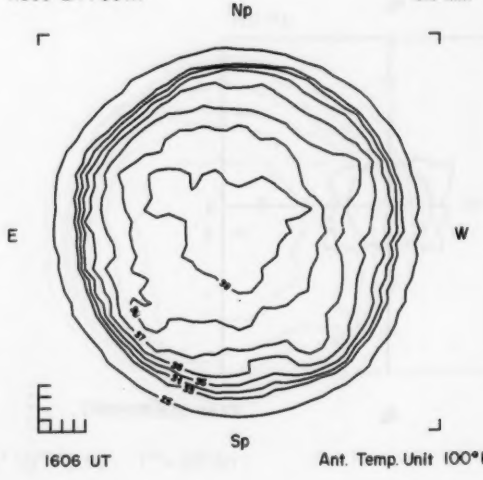
FAIR	S
15 - 2100 - 30	
18 - 0600 - 25	
22 - 0400 - 30	
24 - 0500 - 35	

NOSC LA POSTA 2.0 CM



Ant. Temp. Unit 100°K

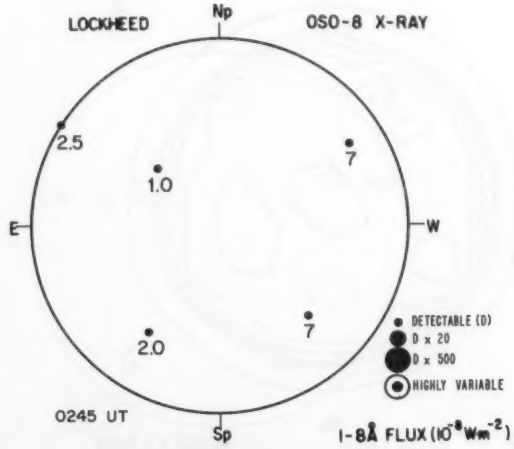
NOSC LA POSTA 8.6 MM



Ant. Temp. Unit 100°K

AUGUST 29, 1977 (P = 20.28, B_o = 7.14, L_o = 68.81)

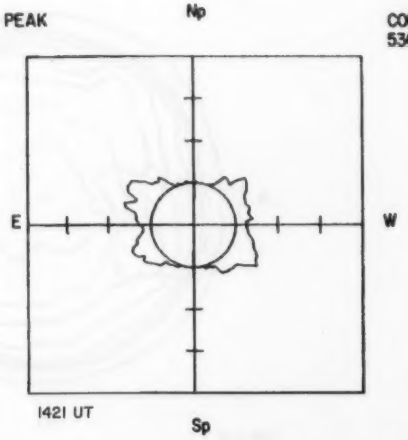
LOCKHEED OSO-8 X-RAY



0245 UT

1-8Å FLUX (10^{-8} Wm^{-2})

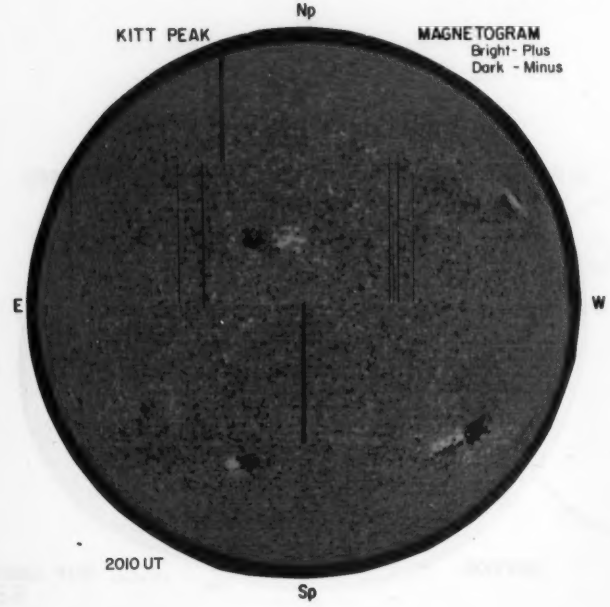
SACRAMENTO PEAK



CORONA (1.15 $R_\odot$)
5303 Å

1421 UT

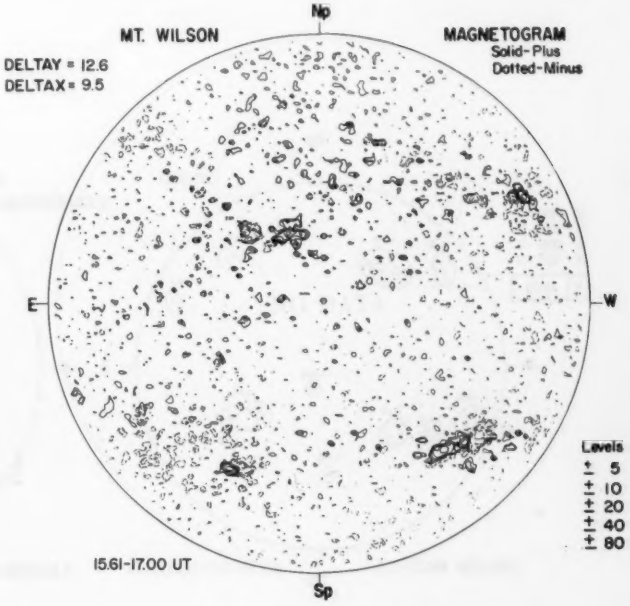
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



2010 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

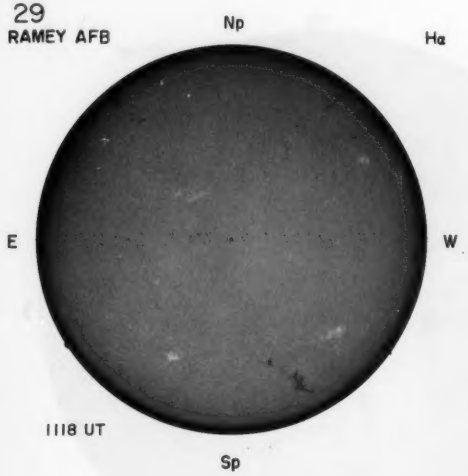
DELTAY = 12.6
DELTAX = 9.5



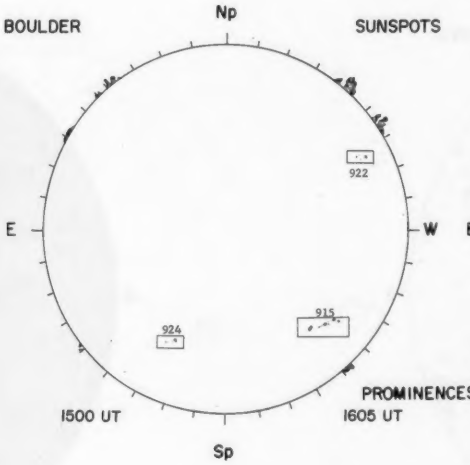
1561-1700 UT

29

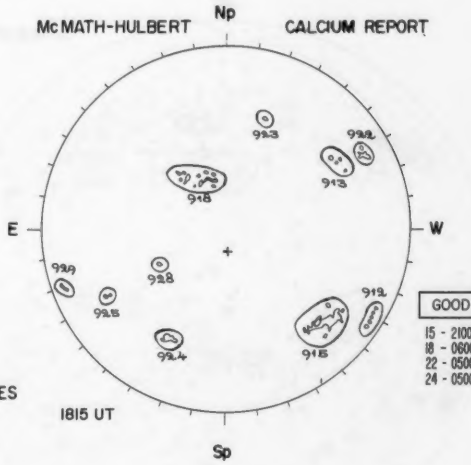
RAMEY AFB



Hα BOULDER



SUNSPOTS



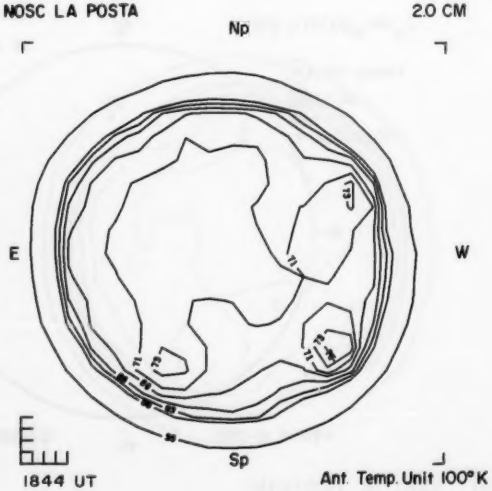
McMATH-HULBERT CALCIUM REPORT

GOOD	S
15 - 2100 - 35	
18 - 0600 - 25	
22 - 0500 - 30	
24 - 0500 - 35	

PROMINENCES

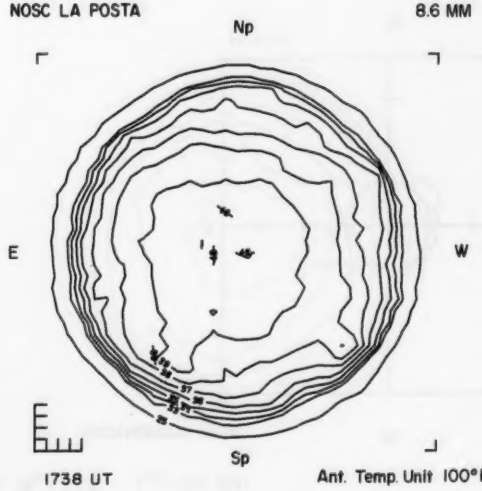
1605 UT

NOSC LA POSTA 2.0 CM



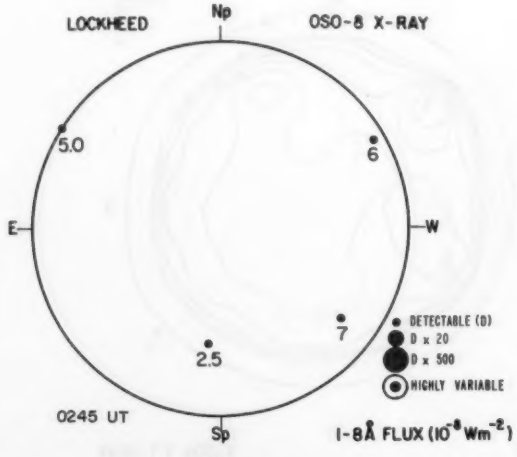
Ant. Temp. Unit 100°K

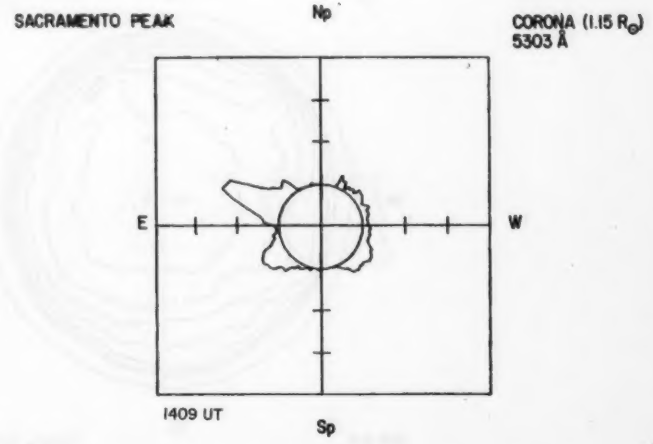
NOSC LA POSTA 8.6 MM

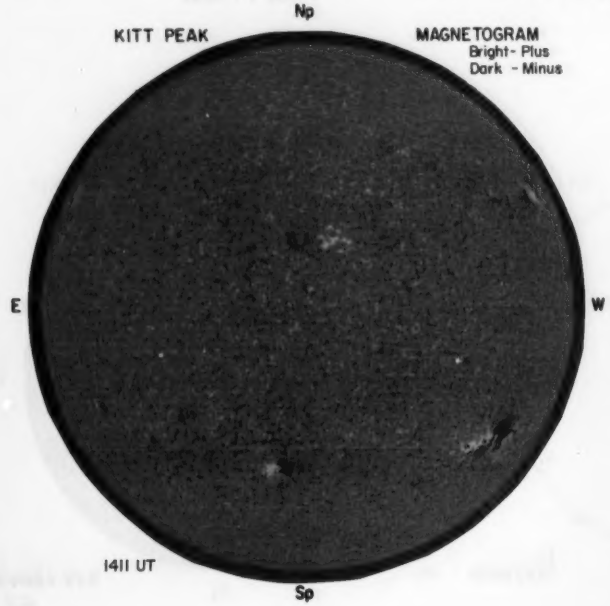


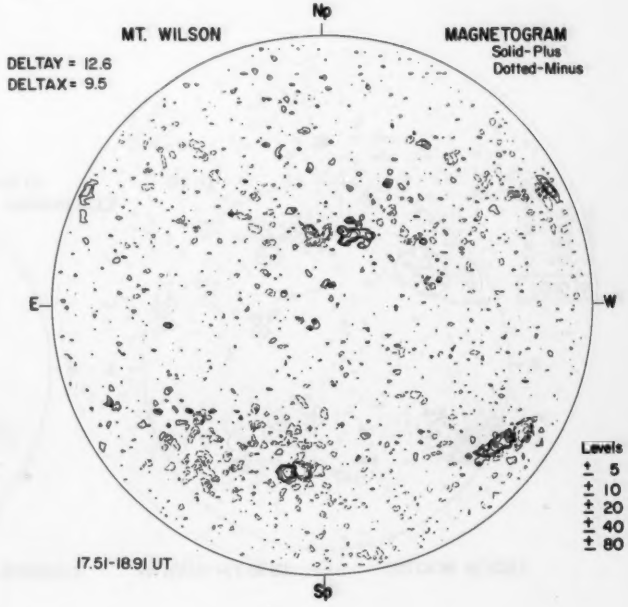
Ant. Temp. Unit 100°K

AUGUST 30, 1977 (P = 20.55, B_o = 7.16, L_o = 55.59)



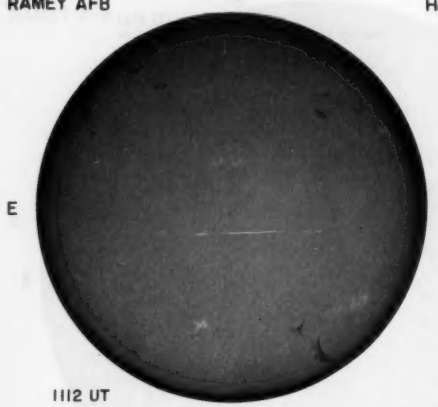






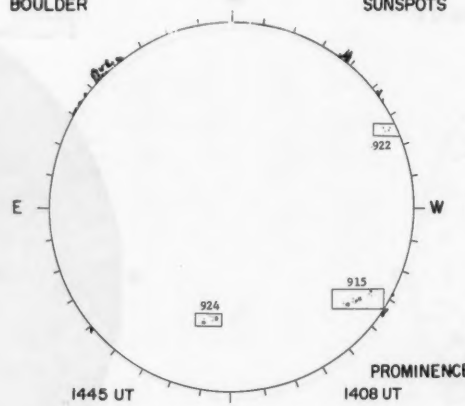
30

RAMEY AFB



1112 UT

Hα BOULDER



1445 UT

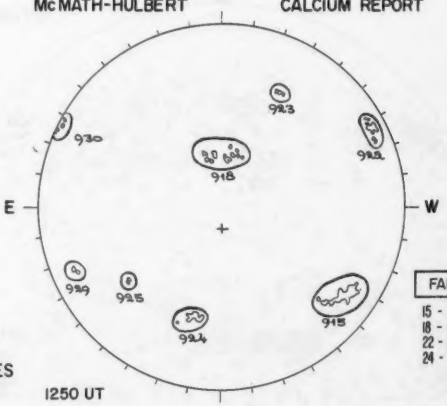
SUNSPOTS

PROMINENCES

1408 UT

McMATH-HULBERT

CALCIUM REPORT

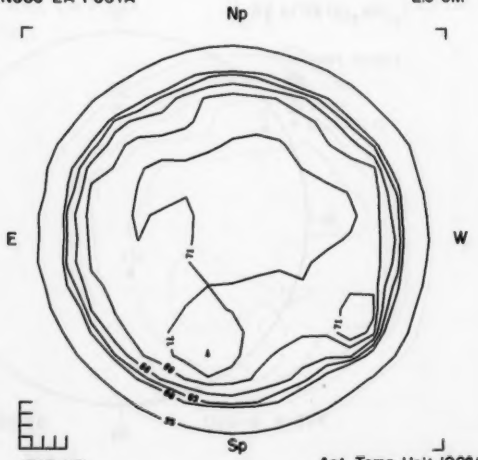


1250 UT

FAIR	D

15 - 2500 - 30
18 - 0600 - 25
22 - 1000 - 30
24 - 0600 - 35

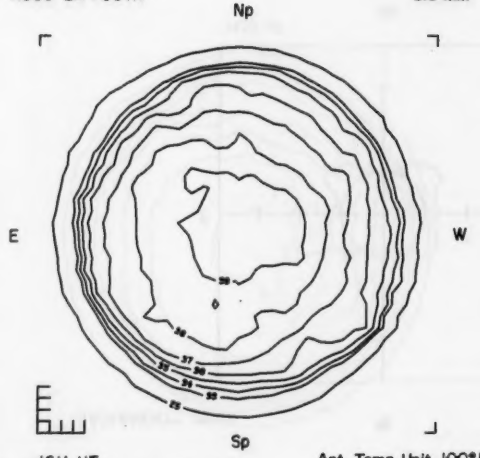
NOSC LA POSTA 2.0 CM



1715 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

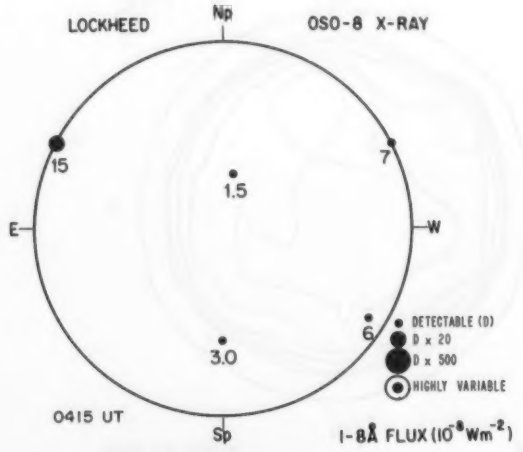


1611 UT

Ant. Temp. Unit 100°K

AUGUST 31, 1977 (P = 20.82, B_o = 7.18, L_o = 42.38)

LOCKHEED OSO-8 X-RAY

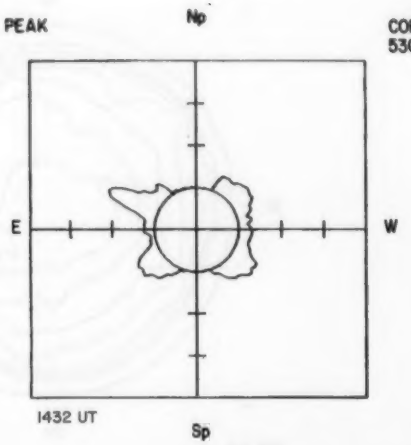


0415 UT

1-8Å FLUX (10^{-8} Wm^{-2})

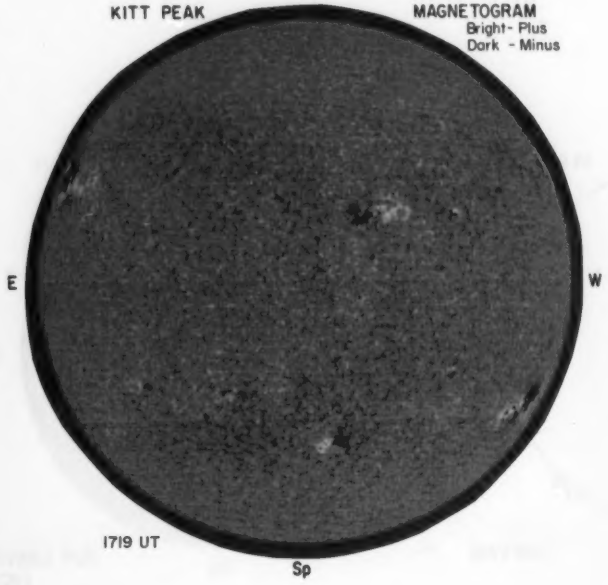
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



1432 UT

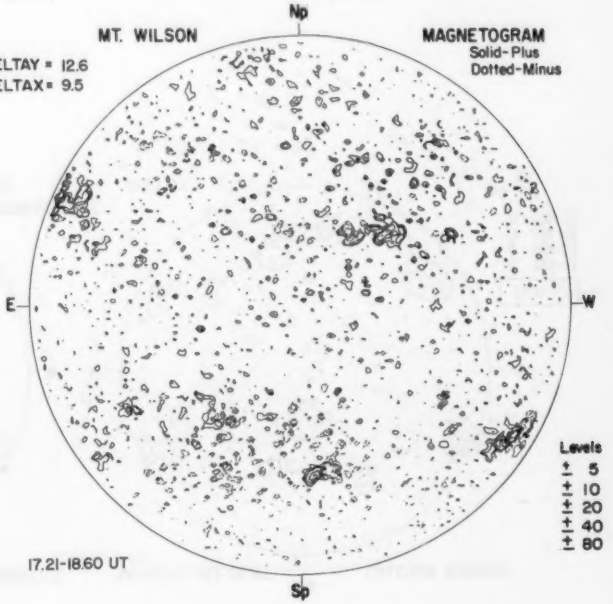
KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1719 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5



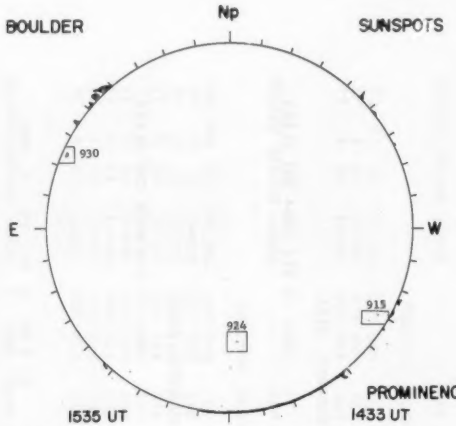
17.21-18.60 UT

31

RAMEY AFB

1057 UT

Hα BOULDER



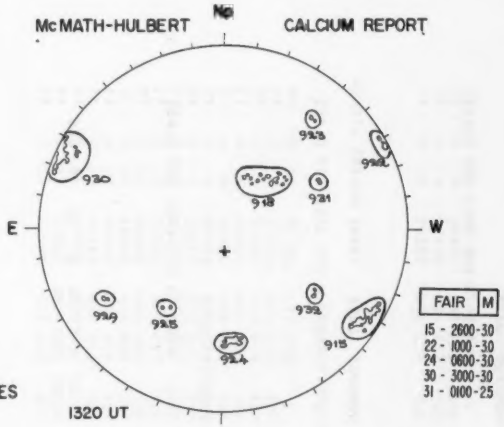
1535 UT

SUNSPOTS

PROMINENCES

1433 UT

McMATH-HULBERT CALCIUM REPORT

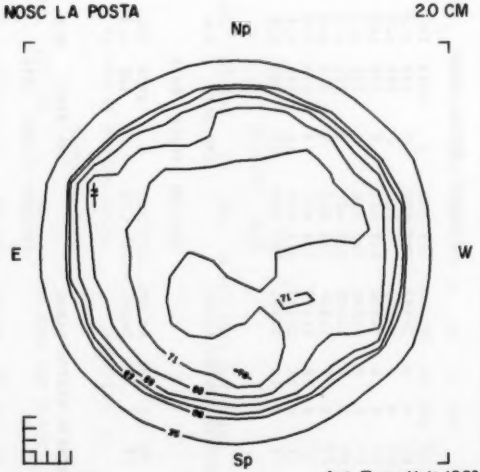


1320 UT

FAIR	M

15 - 2600-30
22 - 1000 -30
24 - 0600-30
30 - 3000-30
31 - 0100-25

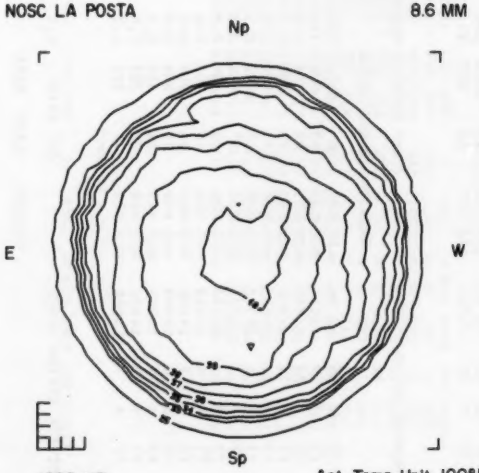
NOSC LA POSTA 2.0 CM



1728 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM



1627 UT

Ant. Temp. Unit 100°K

97
Aug 77

REGIONS OF SOLAR ACTIVITY

AUGUST 1977

MCMATH REGION 14887 CMP DATE 1.6

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	2	14887	S20 W12	69	100	1.5									

MCMATH REGION 14881 CMP DATE 2.5

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	30	14881	N02 E37	60	100	1.5									

MCMATH REGION 14880 CMP DATE 4.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	7	28	14880	N19 E83	43	600	1.0									
77	7	29	14880	N22 E75	37	1100	1.5									
77	7	30	14880	N22 E60	37	900	2.5									
77	7	31	14880	N22 E47	40	900	2.5									
77	8	1	14880	N22 E35	37	1000	2.5									
77	8	2	14880	N22 E20	37	900	3.0	19823	N20 E20	37	(B)	4	B	10	3	BXO
77	8	3	14880	N22 E06	38	600	2.5	19823	N18 E04	39	(AP)	4				
77	8	4	14880	N22 W06	38	600	2.0									
77	8	5	14880	N22 W21	39	600	2.0									
77	8	6	14880	N22 W34	39	500	1.0									
77	8	7	14880	N22 W47	38	400	1.5									
77	8	8	14880	N22 W60	37	300	1.0									
77	8	9	14880	N23 W71	37	300	1.0									

MCMATH REGION 14896 CMP DATE 6.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	10	14896	N12 W61	12	100	1.0									

MCMATH REGION 14890 CMP DATE 6.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	4	14890	S17 E25	7	100	1.5									
77	8	5	14890	S16 E11	7	200	1.5									
77	8	6	14890	S16 W03	8	200	1.5									
77	8	7	14890	S16 W18	9	200	1.5									
77	8	8	14890	S16 W32	9	200	1.5									
77	8	9	14890	S18 W43	9	300	2.0									
77	8	10	14890	S18 W57	8	500	3.0	19826	S17 W57	9	(B)	4	B	20	7	BXO
77	8	11	14890	S17 W70	11	700	3.0	19826	S17 W72	11	(BP	4				
77	8	12	14890	S17 W85	12	500	2.0									

MCMATH REGION 14891 CMP DATE 6.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	4	14891	N32 E25	7	100	1.5									

MCMATH REGION 14892 CMP DATE 8.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	8	14892	N19 W08	345	200	1.5									

REGIONS OF SOLAR ACTIVITY

AUGUST 1977

MCMATH REGION 14889 CMP DATE 8.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	3	14889	N30 E60	345	100	2.0									
77	8	4	14889	N30 E47	346	100	1.5									
77	8	6	14889	N31 E25	341	100	2.0									

MCMATH REGION 14888 CMP DATE 9.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	2	14888	N24 E85	333	900	3.0	19824	N25 E86	332	X	4	B	40	1	HSX
77	8	3	14888	N23 E78	327	1800	3.5	19824	N24 E72	332	(AP)	5	B	170	2	HAX
77	8	4	14888	N24 E65	328	2700	4.0	19824	N24 E60	331	(BP)	5	B	310	14	DAI
77	8	5	14888	N24 E53	326	3500	4.0	19824	N24 E48	330	(D)	5	B	430	33	DKI
77	8	6	14888	N24 E39	327	3100	3.5	19824	N24 E35	330	(D)	5	B	320	41	DAI
77	8	7	14888	N24 E26	325	3000	3.5	19824	N24 E22	329	(D)	5	B	280	22	DSI
77	8	8	14888	N24 E12	325	2700	3.5	19824	N24 E09	329	(D)	5	B	260	39	DSI
77	8	9	14888	N24 E00	326	2700	3.0	19824	N24 W04	329	(D)	5	B	270	22	DSI
77	8	10	14888	N24 W14	325	2500	3.0	19824	N24 W17	329	(D)	5	B	120	19	CSI
77	8	11	14888	N24 W26	327	2500	3.0	19824	N24 W30	329	(B)	5	B	160	18	CSI
77	8	12	14888	N24 W40	327	2800	3.5	19824	N24 W44	329	(BP)	5	B	90	9	CSI
77	8	13	14888	N24 W53	327	2800	3.0	19824	N24 W57	329	(AP)	5	B	80	1	HSX
77	8	14	14888	N25 W66	327	2500	3.0	19824	N24 W69	329	(AP)	5	H	100	1	HSX
77	8	15	14888	N26 W78	326	1800	2.5	19824	N24 W81	327	(AP)	4	B	70	1	HRX
77	8	16	14888	N27 W89	323	600	1.5									

MCMATN REGION 14905 CMP DATE 10.2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	13	14905	S26 W44	318	100	1.5									
77	8	14	14905	S25 W58	319	100	1.0									

MCMATH REGION 14893 CMP DATE 12.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	8	14893	S21 E52	285	200	1.5									
77	8	9	14893	S21 E43	283	200	2.5	19825	S22 E44	281	(AF)	3	B	10	1	AXX
77	8	10	14893	S21 E30	281	300	2.0									
77	8	11	14893	S21 E18	283	300	2.5									
77	8	12	14893	S21 E05	282	200	2.5									
77	8	13	14893	S21 W08	282	200	2.0									
77	8	14	14893	S20 W21	282	200	1.5									
77	8	15	14893	S20 W33	281	200	1.5									

MCMATH REGION 14906 CMP DATE 14.2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	14	14906	N23 W04	265	200	2.5									
77	8	15	14906	N24 W18	266	300	2.0									
77	8	16	14906	N23 W33	267	300	1.0									

MCMATH REGION 14894 CMP DATE 15.8 RETURN OF REGION 14870 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	8	14894	N21 E86	251	300	1.0									
77	8	9	14894	N21 E78	248	800	2.0									
77	8	10	14894	N20 E70	241	1600	3.0									
77	8	11	14894	N20 E58	243	1500	3.5	19827	N18 E59	240	(AP)	3	B	10	1	AXX
77	8	12	14894	N20 E44	243	1500	3.0	19827	N19 E43	242	(AP)	4	B	10	1	AXX
77	8	13	14894	N20 E31	243	1200	2.5									
77	8	14	14894	N21 E17	244	1200	2.5	19827	N20 E22	238	(B)	4				
77	8	15	14894	N21 E04	244	1200	3.0	19827	N20 E10	236	(BF)	3	B	20	3	BXO
77	8	16	14894	N21 W10	244	1200	3.0		N20 W12				H	60	6	DAO
77	8	17	14894	N22 W24	244	1500	3.0		N20 W20				R	20	6	BXO
77	8	18	14894	N22 W36	244	1800	3.0		N20 W33				B	50	7	BXO

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MCMATH REGION 14894 (CONT) CMP DATE 15.8 RETURN OF REGION 14870 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	19	14894	N22 W48	243	2000	3.0	19827	N19 W49	242	(B)	4	R	40	6	DRO
77	8	20	14894	N21 W63	244	2000	3.0	19827	N20 W62	242	(B)	4	B	150	13	DSO
77	8	21	14894					19827	N20 W76	243	(B)	4	B	290	4	DSO
77	8	22	14894	N20 W88	242	1400	2.5	19827	N20 W88	241	(B)	3	B	140	2	DSO

MCMATH REGION 14897 CMP DATE 16.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	10	14897	S27 E80	231	300	1.0									
77	8	11	14897	S26 E65	236	800	2.0									
77	8	12	14897	S26 E51	236	700	2.0									
77	8	13	14897	S26 E40	234	700	2.5									
77	8	14	14897	S26 E27	234	700	2.0									
77	8	15	14897	S26 E14	234	700	2.0									
77	8	16	14897	S26 E01	233	600	2.0									
77	8	17	14897	S25 W11	231	600	2.0									
77	8	18	14897	S25 W24	232	600	1.0									
77	8	19	14897	S25 W36	231	700	1.5									
77	8	20	14897	S24 W56	237	500	1.0									

MCMATH REGION 14900 CMP DATE 17.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	12	14900	N35 E67	220	200	3.0									
77	8	13	14900	N35 E55	219	400	3.0	19829	N36 E52	220	(AF)	4	B	10	1	AXX
77	8	14	14900	N35 E42	219	400	2.5		N36 E46				M	10	1	AXX
77	8	15	14900	N35 E30	218	300	3.0		N30 E31				B	20	3	BXO
77	8	16	14900	N35 E15	219	200	2.5		N28 E14				M	50	6	CRO
77	8	17	14900	N36 E03	217	200	1.5									
77	8	18	14900	N36 W09	217	200	1.0									
77	8	19	14900	N36 W21	216	200	1.0									

MCMATH REGION 14899 CMP DATE 18.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	11	14899	N30 E88	213	700	1.5	19828	N30 E85	214	(AP)	3	B	40	1	AXX
77	8	12	14899	N30 E79	208	1100	2.5	19828	N30 E70	215	(AP)	4	B	10	2	BXO
77	8	13	14899	N29 E65	209	1200	3.5	19828	N31 E57	215	(AP)	4	B	50	6	BXO
77	8		14899					19830	N26 E59	213	(BP)	4	B	10	5	CSO
77	8	14	14899	N29 E50	211	2000	3.5	19828	N31 E45	215	(AP)	4	M	30	4	BXO
77	8		14899					19830	N26 E46	214	(BP)	4	M	80	3	DAO
77	8	15	14899	N29 E37	211	2000	3.5	19828	N31 E33	213	(AP)	4				
77	8		14899					19830	N27 E32	214	(BP)	4	B	70	8	CAO
77	8	16	14899	N29 E23	211	1700	2.5									
77	8	17	14899	N29 E10	210	2200	3.0		N27 E06				R	20	4	CSO
77	8	18	14899	N29 W03	211	2200	3.0		N27 W05				B	40	7	BXO
77	8	19	14899	N30 W16	211	1800	3.0	19830	N27 W22	215	(AP)	4	R	20	4	CRO
77	8	20	14899	N30 W30	211	2000	2.5	19830	N28 W35	215	(AP)	4	B	0	1	AXX
77	8	21	14899					19830	N28 W47	214	(AP)	4	B	10	1	AXX
77	8	22	14899	N30 W56	210	1200	2.5		N27 W59				B	20	1	AXX
77	8	23	14899	N30 W69	211	900	2.0									
77	8	24	14899	N30 W83	211	800	1.5									
77	8	25	14899	N30 W89	205	500	1.0									

MCMATH REGION 14902 CMP DATE 18.3 RETURN OF REGION 14855 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	13	14902	S23 E67	207	1000	1.0									
77	8	14	14902	S23 E55	206	1000	2.0									
77	8	15	14902	S23 E37	211	800	2.0									
77	8	16	14902	S23 E23	211	900	1.5									
77	8	17	14902	S23 E10	210	800	1.5									
77	8	18	14902	S23 W02	210	700	1.5									
77	8	19	14902	S23 W13	208	600	2.0									
77	8	20	14902	S22 W27	208	500	1.5									
77	8	21	14902						S21 W42				B	10	4	BXO
77	8	22	14902	S22 W53	207	800	3.5	19835	S22 W56	209	(B)	4	B	60	8	CRO

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MCMATH REGION 14902 (CONT) CMP DATE 18.3 RETURN OF REGION 14855 ROTATION 4

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	23	14902	S22 W66	208	1000	3.5	19835	S21 W68	208	(BF)	4	B	20	2	BXO
77	8	24	14902	S22 W80	208	900	3.0									

MCMATH REGION 14903 CMP DATE 19.7 RETURN OF REGION 14863 ROTATION 2

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	13	14903	N21 E83	191	900	1.5		N19 E78				B	10	1	AXX
77	8	14	14903	N23 E70	191	900	2.0	19831	N19 E66	194	(AP)	4	H	50	1	HRX
77	8	15	14903	N22 E58	190	1200	2.0	19831	N19 E53	193	(AP)	4	B	60	2	HAX
77	8	16	14903	N21 E43	191	1000	2.0		N19 E33				H	10	1	AXX
77	8	17	14903	N22 E30	190	1200	2.5									
77	8	18	14903	N22 E16	192	1300	2.5									
77	8	19	14903	N22 E03	192	1300	2.5									
77	8	20	14903	N22 W11	192	1300	2.5	19833	N20 W21	201	(B)	3				
77	8	21	14903					19833	N20 W33	200	(BF)	3	B	10	9	BXO
77	8	22	14903	N22 W39	193	1300	2.5	19833	N19 W46	199	(AP)	3	B	30	5	BXO
77	8	23	14903	N22 W52	194	800	2.0									
77	8	24	14903	N22 W67	195	800	2.0									
77	8	25	14903	N22 W80	196	800	2.0									

MCMATH REGION 14907 CMP DATE 19.8 RETURN OF REGION 14855 ROTATION 4

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	14	14907	S28 E70	191	400	1.5									
77	8	15	14907	S27 E55	193	500	2.0									
77	8	16	14907	S27 E43	191	500	2.0									
77	8	17	14907	S28 E29	191	600	1.5									
77	8	18	14907	S28 E16	192	600	1.5									
77	8	19	14907	S28 E04	191	600	2.0									
77	8	20	14907	S28 W10	191	400	1.5									
77	8	22	14907	S28 W35	189	400	1.0									
77	8	23	14907	S28 W46	188	200	1.0									

MCMATH REGION 14904 CMP DATE 20.0

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	13	14904	N35 E85	189	600	2.0									
77	8	14	14904	N35 E72	189	800	2.0									
77	8	15	14904	N35 E60	188	700	2.0									
77	8	16	14904	N35 E45	189	600	2.0									
77	8	17	14904	N35 E32	188	400	2.5									
77	8	18	14904	N36 E19	189	400	2.5									
77	8	19	14904	N36 E07	188	500	2.0									
77	8	20	14904	N36 W06	187	600	2.0									
77	8	22	14904	N36 W31	185	500	1.0									
77	8	23	14904	N36 W44	186	300	1.5									
77	8	24	14904	N36 W58	186	200	1.0									
77	8	25	14904	N36 W70	186	200	1.0									

MCMATH REGION 14919 CMP DATE 20.5

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	24	14919	N10 W54	182	100	2.0									
77	8	25	14919	N10 W66	182	200	2.0									
77	8	26	14919	N10 W80	182	200	1.0									

MCMATH REGION 14908 CMP DATE 20.9

				CALCIUM PLAGE DATA					SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	16	14908	N22 E58	176	200	3.0		N21 E51				H	20	2	BXO
77	8	17	14908	N22 E45	175	400	3.0		N23 E43				R	20	4	BXO
77	8	18	14908	N23 E31	177	500	3.5		N23 E29				B	40	7	CRO
77	8	19	14908	N23 E18	177	600	3.0	19832	N22 E15	178	(BP)	4	R	20	4	BXO

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MCMATH REGION 14908 (CONT) CMP DATE 20.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	20	14908	N23 E04	177	700	2.5	19832	N22 E03	177	(8)	4	B	10	3	BXO
77	8	22	14908	N23 W23	177	600	2.5									
77	8	23	14908	N23 W36	178	400	2.0									
77	8	24	14908	N24 W50	178	400	2.5									
77	8	25	14908	N23 W66	182	400	1.5									
77	8	26	14908	N21 W79	181	400	1.0									

MCMATH REGION 14920 CMP DATE 21.9

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	24	14920	N23 W35	163	300	2.5	19837	N19 W37	164	(BP)	4	R	20	4	CRO
77	8	25	14920	N22 W48	164	400	3.5	19837	N21 W50	165	(AP)	3				
77	8	26	14920	N22 W63	165	900	2.5	19837	N21 W65	167	(AP)	3				
77	8	27	14920	N22 W77	164	900	2.0									
77	8	28	14920	N22 W89	164	400	2.0									

MCMATH REGION 14909 CMP DATE 23.0 RETURN OF REGION 14875 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	16	14909	S28 E38	146	300	1.5									
77	8	17	14909	S28 E70	150	600	2.5		S27 E68				R	10	1	AXX
77	8	18	14909	S28 E56	152	600	2.5		S28 E50				B	20	1	AXX
77	8	19	14909	S28 E44	151	300	2.0		S26 E39				R	10	1	AXX
77	8	20	14909	S28 E30	151	500	1.5									
77	8	22	14909	S28 E05	149	500	2.0									
77	8	23	14909	S28 W07	149	300	1.5									
77	8	24	14909	S29 W20	148	200	1.0									
77	8	25	14909	S29 W33	149	400	1.0									
77	8	26	14909	S28 W46	148	300	1.0									
77	8	27	14909	S28 W60	147	300	1.0									

MCMATH REGION 14910 CMP DATE 23.5 RETURN OF REGION 14866 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	17	14910	N24 E83	137	600	1.0									
77	8	18	14910	N23 E70	138	800	1.5									
77	8	19	14910	N23 E56	139	400	2.0									
77	8	20	14910	N24 E40	141	600	1.5									
77	8	22	14910	N25 E14	140	800	2.0									
77	8	23	14910	N25 E00	142	600	1.5									
77	8	24	14910	N25 W14	142	600	1.0									
77	8	25	14910	N25 W25	141	600	1.0									
77	8	26	14910	N25 W39	141	500	1.0									
77	8	27	14910	N25 W54	141	400	1.0									
77	8	28	14910	N25 W65	140	500	1.5									

MCMATH REGION 14912 CMP DATE 24.5 RETURN OF REGION 14874 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	19	14912	S25 E61	134	500	1.0									
77	8	20	14912	S25 E49	132	500	1.0									
77	8	22	14912	S26 E27	127	700	1.0	19836	S27 E25	128	(AP)	3	B	10	1	AXX
77	8	23	14912	S26 E13	129	400	1.0									
77	8	24	14912	S27 E00	128	300	2.0									
77	8	25	14912	S27 W11	127	500	2.0									
77	8	26	14912	S27 W23	125	400	1.5									
77	8	27	14912	S26 W37	124	300	1.5									
77	8	28	14912	S26 W49	124	300	1.0									
77	8	29	14912	S27 W63	122	300	1.0									

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MCMATH REGION 14922 CMP DATE 25.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	26	14922	N28 W18	120	300	2.5	19838	N27 W16	118	(AF)	2				
77	8	27	14922	N28 W32	119	500	3.5	19838	N27 W29	117	(B)	3				
77	8	28	14922	N28 W44	119	400	3.0	19838	N27 W44	119	(B)	4				
77	8	29	14922	N28 W59	118	500	3.0	19838	N28 W55	117	(BP)	3				
77	8	30	14922	N28 W69	118	1000	3.0	19838	N28 W71	119	B	2				
77	8	31	14922	N28 W82	118	1000	3.0									

MCMATH REGION 14913 CMP DATE 26.0 RETURN OF REGION 14883 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	19	14913	N30 E85	110	400	1.0									
77	8	20	14913	N28 E71	110	500	1.5									
77	8	22	14913	N30 E47	107	500	1.5									
77	8	23	14913	N30 E33	109	400	1.0									
77	8	24	14913	N30 E19	109	500	1.0									
77	8	25	14913	N30 E06	110	500	1.0									
77	8	26	14913	N30 W04	106	300	1.0									
77	8	27	14913	N30 W17	104	200	1.0									
77	8	28	14913	N28 W28	103	200	1.0									
77	8	29	14913	N28 W42	101	200	1.0									

MCMATH REGION 14915 CMP DATE 26.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	20	14915	S25 E90	91	400	2.0									
77	8	21	14915					19834	S25 E66	101	X	1	B	10	1	AXX
77	8	22	14915	S25 E60	94	800	3.0	19834	S25 E52	101	(AP)	3	B	30	2	AXX
77	8	23	14915	S25 E46	96	1000	3.0	19834	S26 E39	101	(BP)	3	B	10	2	AXX
77	8	24	14915	S25 E31	97	1700	3.5	19834	S25 E28	99	(B)	4	R	50	10	CRO
77	8	25	14915	S25 E18	98	1600	3.5	19834	S25 E15	100	(BP)	4				
77	8	26	14915	S25 E04	98	2100	3.0	19834	S25 E03	99	(BP)	3				
77	8	27	14915	S25 W10	97	2300	3.0	19834	S25 W11	99	(BY)	4				
77	8	28	14915	S25 W23	98	2100	3.0	19834	S25 W24	99	(B)	4				
77	8	29	14915	S25 W38	97	2100	3.5	19834	S25 W36	98	(BF)	3				
77	8	30	14915	S25 W49	98	2500	3.0	19834	S25 W50	98	(BF)	4				
77	8	31	14915	S25 W60	96	2600	3.0	19834	S26 W60	95	(B)	3				
77	9	01	14915	S25 W73		2200	2.5									
77	9	02	14915	S26 W89		900	1.5									

MCMATH REGION 14917 CMP DATE 27.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	22	14917	N11 E62	92	200	1.5									

MCMATH REGION 14923 CMP DATE 28.3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	26	14923	N44 E23	79	200	2.5	19839	N45 E22	80	(AF)	2				
77	8	27	14923	N44 E08	79	100	1.0									
77	8	28	14923	N44 W04	79	200	1.0	19840	N38 W14	89	(BP)	2				
77	8	29	14923	N44 W17	76	200	1.0									
77	8	30	14923	N44 W28	77	200	2.0									
77	8	31	14923	N44 W41	77	100	1.0									

MCMATH REGION 14927 CMP DATE 28.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	28	14927	N15 E03	72	100	1.5									

REGIONS OF SOLAR ACTIVITY

AUGUST 1977

MCMATH REGION 14931 CMP DATE 29.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	31	14931	N21 W34	70	100	2.5									
77	9	01	14931	N21 W47		300	2.5	19843	N20 W41		(B)	3				
77	9	02	14931	N21 W61		200	1.5									
77	9	03	14931	N21 W73		300	1.0									

MCMATH REGION 14934 CMP DATE 29.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	01	14934	N28 W45		300	2.5	19844	N28 W45		(AF)	3	B	10	1	A
77	9	02	14934	N28 W59		300	2.0	19844	N27 W60		(B)	3	B	10	2	B
77	9	03	14934	N28 W71		300	2.0									
77	9	04	14934	N28 W85		300	1.0									

MCMATH REGION 14937 CMP DATE 29.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	04	14937	S30 W85		100	1.5									

MCMATH REGION 14932 CMP DATE 29.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	31	14932	S14 W31	67	100	1.5									

MCMATH REGION 14918 CMP DATE 30.5 RETURN OF REGION 14880 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	23	14918	N20 E90	52	400	1.0									
77	8	24	14918	N21 E78	50	1500	2.5									
77	8	25	14918	N22 E66	50	1200	2.5									
77	8	26	14918	N22 E53	49	900	2.5									
77	8	27	14918	N22 E38	49	700	2.5									
77	8	28	14918	N22 E25	50	600	2.5									
77	8	29	14918	N22 E10	49	600	2.5									
77	8	30	14918	N22 W01	50	600	2.5									
77	8	31	14918	N22 W13	49	600	2.0									
77	9	01	14918	N22 W26		700	2.0									
77	9	02	14918	N23 W40		600	2.0									
77	9	03	14918	N23 W53		500	2.0									
77	9	04	14918	N23 W66		500	1.5									
77	9	05	14918	N21 W80		400	1.0									

MCMATH REGION 14924 CMP DATE 31.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	27	14924	S30 E46	41	500	3.5									
77	8	28	14924	S31 E33	42	500	3.5	19841	S32 E35	40	(AF)	3				
77	8	29	14924	S30 E21	38	500	3.5	19841	S30 E21	41	(B)	3				
77	8	30	14924	S30 E09	40	600	3.5	19841	S30 E07	41	(B)	3				
77	8	31	14924	S31 W04	40	600	3.0	19841	S32 W03	38	(AF)	3				
77	9	01	14924	S31 W16		600	3.0									
77	9	02	14924	S31 W30		500	3.0									
77	9	03	14924	S31 W42		600	2.5									
77	9	04	14924	S31 W55		500	2.5									
77	9	05	14924	S31 W70		600	2.0									

REGIONS OF SOLAR ACTIVITY

AUGUST 1977

MCMATH REGION 14928 CMP DATE 31.4

				CALCIUM		PLAGE DATA				SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	8	29	14928	S04	E22	37	100	1.5										

MCMATH REGION 14938 CMP DATE 31.4

				CALCIUM		PLAGE DATA				SUNSPOT DATA						
YR	MO	DA	MC NO.	LAT	CMD	L	AREA	INT	MW NO.	LAT	CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	9	04	14938	N27	W51		100	1.0										

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on August 21, 1977. No sunspot observations were made at Mt. Wilson on August 16, 17 and 18, 1977.

Errata: Region 14834 was shown to CMP on June 29.9, 1977 (*SGD* 396 Part I, page 99). This region actually went through CMP on July 1.2, 1977.

DAILY CALCIUM PLAGE INDEX

AUGUST 1977

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	8	1	9.7	77	8	11	10.5	77	8	21	*
77	8	2	7.4	77	8	12	11.6	77	8	22	11.6
77	8	3	3.6	77	8	13	11.0	77	8	23	7.3
77	8	4	5.5	77	8	14	13.6	77	8	24	9.1
77	8	5	8.8	77	8	15	14.8	77	8	25	9.4
77	8	6	8.4	77	8	16	12.5	77	8	26	10.1
77	8	7	9.2	77	8	17	16.9	77	8	27	11.0
77	8	8	9.3	77	8	18	18.2	77	8	28	9.5
77	8	9	8.5	77	8	19	17.6	77	8	29	9.4
77	8	10	9.4	77	8	20	14.7	77	8	30	9.0
								77	8	31	8.6

* NO OBSERVATIONS

SUDDEN IONOSPHERIC DISTURBANCES

AUGUST 1977

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
04	1557	1620	1601	1-	1			1					1558	14888
04	1828	1855	1831	1-	1	1							1825E	14888
04	2100	2145	2110	1-	5	1			1		5		2054	14888
04	2224	2254	2235	1-	3				1		2		2225	14888
05	1140	1210	1145	1-	1				1				1140E	14888
05	1237	1330	1250	1-	5	1		1	2		1		1234	14888
05	1412	1600	1420	1+	5	4	1	6	1		10		1410E	14888
05	1857	2030	1907	2	5	3		1	2	1	10	1	1858	14888
06	1046	1200	1106	1-	3			1	1		2		NF	
07	1315	1400	1325	1-	3			1	1		2		1322E	14888
23	0448	0538	0503	1-	1				1				0448	X-RAY
26	0537	0625	0542	1-	1				1				0542E	14915
27	1105	1140	1110	1-	3	1			1				1105	14915
31	1009	1030	1013	1-	3	2					1		1004	14930

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-31	0000-2400 A36
01-24	0000-2400 A19
01-17	0000-2400 A28
04	1830-2107 UM (18 kHz)
10-31	0000-2400 A37
11	2110-2120 TM
12-13	2317-0047 UM (13 kHz)
13	1923-2035 TM
16	1310-1445 UM (13 kHz)
17	1806-1854 TM, 2236-2300 TM
18	1140-1400 UM (13 kHz), 1626-1732 TM, 1740-1809 TM, 1922-1954 TM
22	2145-2204 TM
26	1210-1248 UM (13 kHz), 2010-2040 UM (13 kHz)
28-29	1749-1127 MC
30-31	0000-2400 A34
31	0000-2400 TN

STATIONS REPORTING FOR AUGUST 1977

AAVSO (A1, A19, A21, A28, A30, A31, A34, A35, A36, A37, A40) (SES) (A1, A26, A31) (SEA) (A31) (SWF)
DARMSTADT (DA) (SWF)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
HUANCAYO (HU) SWF)
INUBO (IN) (SPA)
KONA (KN) SFD)
KUHLUNGSBORN (KU) (SEA)
MAUI (KL) (SFD)
MC MATH (MC) (SWF, SCNA)
NEW JERSEY (NJ) (SES)
PANSKA VES (PU) (SWF, SEA, SES)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SES)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI)

SID's BY McMATH REGION

AUGUST 1977

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
88				4	4		1																								
15																										1	1				
30																															1
X-RAY																							1								
UNKNOWN																															
NO FP						1																									

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0447	0821	DURN										
	0455	0740	WEIS										
	0743	1115	WEIS										
	0852	1831	DURN										
	0939	2359	SGMR										
	1245	2245	HARV										
02	0447	0800	DURN										
	0500	1114	WEIS										
	0905	1831	DURN										
	0940	2358	SGMR										
	1245	2245	HARV										
03	0448	1832	DURN										
	0941	2357	SGMR										
	1245	2245	HARV										
04	0449	0729	DURN										
	0942	2355	SGMR										
	1016	1830	DURN										
	0935	1758	OWIN				1036.5	1036.7	1				IIIG
	1245	2245	HARV										
05	0449	0822	DURN										
	0758	1345	OWIN										
	0847	1830	DURN										III,G
	0943	2354	SGMR										
	1240	1655	WEIS										
	1245	2245	HARV										
	1436	1750	OWIN										
	1730	1811	WEIS										
06	0449	0810	DURN										
	0835	1830	DURN										
	0842	1142	WEIS										
	0944	2353	SGMR										
	1224	1550	WEIS										
	1636	1752	OWIN				1636	1752	1				IN
	1648	1810	WEIS										
	1245	2245	HARV				1757		1	1757		1	IIIB
07	0444	0735	WEIS										
	0451	0804	DURN										
	0737	1404	WEIS				0857.5	0857.8	1				IIIG
	0946	2352	SGMR										
	0829	1830	DURN	1228	1300	1	1228	1300	1				I,N
	1245	2245	HARV										
	1650	1759	OWIN				1650	1759	1				IN
			OWIN				1713.3	1713.5	2				IIIG
08	0505	1132	WEIS										
	0452	0805	DURN				0558	0558.7	2				I
	0827	1309	DURN										
	0947	2350	SGMR										
	1024	1353	OWIN										
	1135	1812	WEIS										
	1245	2245	HARV										
	1315	1830	DURN	1315 E	1830 D		1315 E	1830 D					IW,N
09	0452	0805	DURN										
	0802	1400	OWIN										
	0827	1830	DURN										
	0948	2349	SGMR										
	1112	1808	WEIS										
	1245	2245	HARV										
10	0448	1158	WEIS										
	0453	0833	DURN										
	0754	0914	OWIN										
	0856	1830	DURN										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
10	0932	1325	OWIN										
	0949	2348	SGMR										
	1230	1404	WEIS										
	1245	2215	HARV										
	1420	1805	WEIS										
11	0454	0808	OWRN										
	0706	1805	WEIS										
	0824	1830	OWRN										
	0922	1345	OWIN										
	0950	2346	SGMR										
	1245	2215	HARV										
12	0452	0846	WEIS										
	0456	0809	OWRN										
	0835	1826	OWRN										
	0900	1234	WEIS										
	0951	2345	SGMR										
	0855	1350	OWIN				1123.7	1123.8	1				IIIG
	1245	2215	HARV										
			OWIN				1258.0	1258.5	1				IIIG
	1304	1802	WEIS										
13	0453	1651	WEIS										
	0456	0814	OWRN										
	0835	1825	OWRN										
	0952	2344	SGMR										
	1245	2215	HARV										
	1654	1805	WEIS										
14	0456	1823	OWRN										
	0953	2342	SGMR										
	1245	2215	HARV										
15	0456	1822	OWRN	0548	1822		0548	1822					IW,N
	0954	2341	SGMR										
	1300	2245	HARV										
16	0456	1821	OWRN										
	0916	1353	OWIN										
	0955	2339	SGMR										
	1245	2245	HARV										
17	0457	0642	OWRN										
	0956	2338	SGMR										
	0855	1410	OWIN				1052.9	1053.2	1				IIIG
	1245	2245	HARV										
	1601	1757	WEIS										
18	0457	1755	WEIS										
	0726	1342	OWIN										
	0834	1817	OWRN										
	0957	2336	SGMR										
	1245	2245	HARV										
19	0458	0945	WEIS										
	0502	0819	OWRN										
	0700	1246	OWIN				0830.2	0830.3	1				IIIG
	0949	1004	WEIS										
	0958	2335	SGMR										
	1018	1756	OWRN										
	1245	2245	HARV										
20	0508	1757	OWRN										
	0959	2333	SGMR										
	1300	1825	HARV										
21	0508	1756	OWRN	0508 E	1756	2	0508 E	1756	2				IC,DC,N
	1000	2332	SGMR										
	1227	1748	WEIS										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
21	1300	2245	HARV										
			DURN	1556.2	1556.8	3	1556.2	1556.8	3				IIIG,RS
22	0713	1746	WEIS				0719.5	0719.7	2				IIIB
	1001	2330	SGMR										
	1001	1744	DWIN				1001	1744	1				IN
			DWIN				1035.1						IIIB
			DWIN				1228.0	1228.6	2				IIIG
	1300	2245	HARV										
	1355	1755	DURN	1355 E	1755		1355	1755					IW,N
	0610	1252	DURN	1610	1252 D		0610	1252 D					IW,N
23	0514	0835	DURN	0514	0835		0514	0835					IW,N
	0733	1205	WEIS										
	0843	1758	DURN	0843	1758		0843	1758					IW,N
	1002	2328	SGMR										
	1300	2245	HARV										
	1419	1744	WEIS										
24	0508	0754	DURN										
	0505	0705	WEIS				0530.1	0530.7	2				IIIG
			WEIS				0613.7	0614.2	1				IIIG
	0913	1757	DURN										
	0741	1035	WEIS				1031.2	1031.4	2				IIIB
	1004	2327	SGMR							1359.4	1456.5	1	IIIG
	1408	1506	WEIS				1504.8	1504.9	1				IIIB
	1300	1734	HARV				1632	1637	2	1632	1637	2	IIIG
	1514	1745	WEIS				1633.4	1633.5	1				IIIB
			SGMR							1633.5	1637.5	1	IIIG
			WEIS				1635.5	1635.6	1				IIIB
			SGMR							1803.0	1804.2	1	III
	1740	2245	HARV				1804		2	1804		2	IIIB
			HARV				1819		3	1819		3	IIIB
			SGMR							1923.0	1928.1	3	V
			HARV				1924	1928	3	1924	1928	3	IIIGG,V
			SGMR							2100.0	2100.7	1	IIIG
			HARV				2100	2101	1	2100	2101	1	IIIG
			SGMR							2216.0	2218.0	2	V
			HARV				2216	2218	3	2216	2218	3	IIIG,V
25	0506	0804	WEIS										
	0806	0954	WEIS										
	1014	1052	WEIS										
	1054	1326	WEIS										
	0509	1756	DURN	1300	1756		1300	1756					IW,N
	1330	1743	WEIS				1554.2	1555.9	2				IIIG
	1005	2325	SGMR							1554.7	1557.6	2	IIIG
	1301	2052	HARV				1554	1555	2	1555		2	IIIG
			HARV				1557		2	1557		2	IIIB
			WEIS				1625.8	1626.1	2				IIIG
			HARV				1626		1				IIIG
			HARV				1755		1				IIIG
			HARV				1838	1839	1	1838	1839	1	IIIG
			SGMR							1944.7	1946.4	3	V
			HARV				1944	1946	3	1944	1946	3	IIIG,V
	2055	2245	HARV										
26	0507	0732	WEIS				0508.0	1736.5	2				IIIN
	0509	1237	DURN	0509	1237		0509	1237					IW,N
			DURN	0516.5	0517.0	3	0516.5	0517.0	3				III,G
			DURN	0524.0	0525.4	3	0524.0	0525.4	3				IIIG
			DURN	0524.5	0525.7	3							DCIM
			DURN				0535.4	0537.0	3				IIIG,RS
			DURN	0536.9	0541.5	3	0536.9	0541.5	3				DCIM,IIIG
			WEIS				0538.0	0539.5	3				IIIG
			WEIS	0538.5	0539.3	2							CONT
			WEIS				0540.1	0540.9	3				IIIG
			WEIS				0541.9	0549.7	3				II
			WEIS				0630.6	0631.2	3				IIIG
			DURN	0630.6	0632.3	3	0630.6	0632.3	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
26	0715	0757	OWIN				0715	0757	1				IN
			OWIN				0727.0	0727.5	1				IIIG
			OWIN				0731.0	0732.0	2				IIIG
			WEIS				0731.1	0731.9	3				IIIG
			DURN	0731.3	0731.5	1	0731.3	0731.5	1				IIIG
	0737	1328	WEIS										
	0715	0757	OWIN				0741.9	0742.3	2				IIIG
			DURN	0742.2	0742.2	1	0742.2	0742.2	1				III
			OWIN				0743.3	0743.9	2				IIIG
			DURN	0746.1	0746.7	1	0746.1	0746.7	2				IIIG
			OWIN				0746.7		2				IIIB
	0943	1141	OWIN				0943	1141	1				IN
			OWIN				1030.5	1032.1	2				IIIG
			DURN	1209.6	1209.6	1	1209.6	1209.6	1				III
	1234	1435	OWIN				1234	1435	1				IN
	1242	1758	DURN	1242	1758 D	1	1242	1758 D	1				I,OC,N
			OWIN				1250.0	1250.1	1				IIIG
			OWIN				1322.2	1322.4					IIIG
			OWIN				1326.1	1326.2	2				IIIG
			OWIN				1418.7	1419.8	2				IIIG
	1417	1741	WEIS				1418.7	1419.9	2				IIIG
	1300	2245	HARV				1420		1				IIIB
			OWIN				1421.3	1422.1	2				IIIG
			WEIS				1440.4	1440.5	2				IIIG
			WEIS				1450.7	1451.2	2				IIIG
			HARV				1451		2				IIIG
			WEIS				1533.9	1534.2	2				IIIG
			HARV				1534		1				IIIG
			WEIS				1636.6	1636.8	2				IIIG
			WEIS				1639.8	1639.4	2				IIIG
	1006	2323	SGMR							1639.3	1639.5	1	III
			HARV				1639		3				IIIG,V
			DURN	1645.7	1646.4	3	1645.7	1646.4	3				IIIG,V
			WEIS				1645.7	1646.7	3				IIIGG
			SGMR							1645.9	1646.2	1	V
			HARV				1646	1647	3	1646	1647	3	IIIG,V
			DURN	1703.4	1704.2	1	1703.4	1704.2	2				IIIG
			DURN				1706.0	1706.0	1				III
			HARV				1715		1				IIIG
			DURN	1736.4	1736.5	3	1736.4	1736.5	3				III
			SGMR							1822.8	1823.3	1	III
			HARV				1823		3	1823		3	IIIG
27	0508	1739	WEIS										
	0509	0624	DURN	0509 E	0624 D	1	0509 E	0624 D	1				I,N
	1007	2322	SGMR										
	1300	2245	HARV										
28	0510	0908	WEIS				0736.7	0736.8	1				IIIB
	1002	1800	DURN	1002 E	1800	1	1002 E	1800	1				IC,OC,N
	1008	2320	SGMR										
	1028	1737	WEIS				1306.4	1307.2	1				IIIG
			DURN	1558.2	1558.2	2	1558.2	1558.2	2				IIIG
			WEIS				1558.3	1558.4	2				IIIG
	1300	1916	HARV				1558		1				IIIB
	1621	1754	OWIN				1621	1754	1				IC
			WEIS				1629.8	1629.9	2				IIIB
			HARV				1630		1	1630		1	IIIG,W
	2122	2245	HARV										
29	0509	0734	DURN	0509 E	0734 D	1	0509 E	0734 D	1				IC,N
			DURN	0540.5	0541.9	1	0540.5	0541.9	1				IIIG
	0512	1735	WEIS				0540.7	0541.2	2				IIIG
	1810	1430	DURN	0810 E	1430		0810 E	1430					I,W,N
	1022	1152	OWIN				1022	1152	1				IS
			WEIS				1453.9	1454.1	1				IIIG
	1453	1601	OWIN				1453	1601	1				IN
			WEIS				1455.7	1456.4	2				IIIG
	1009	2319	SGMR							1456.8	1457.2	1	III
	1440	2245	HARV				1456		2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

AUGUST 1977

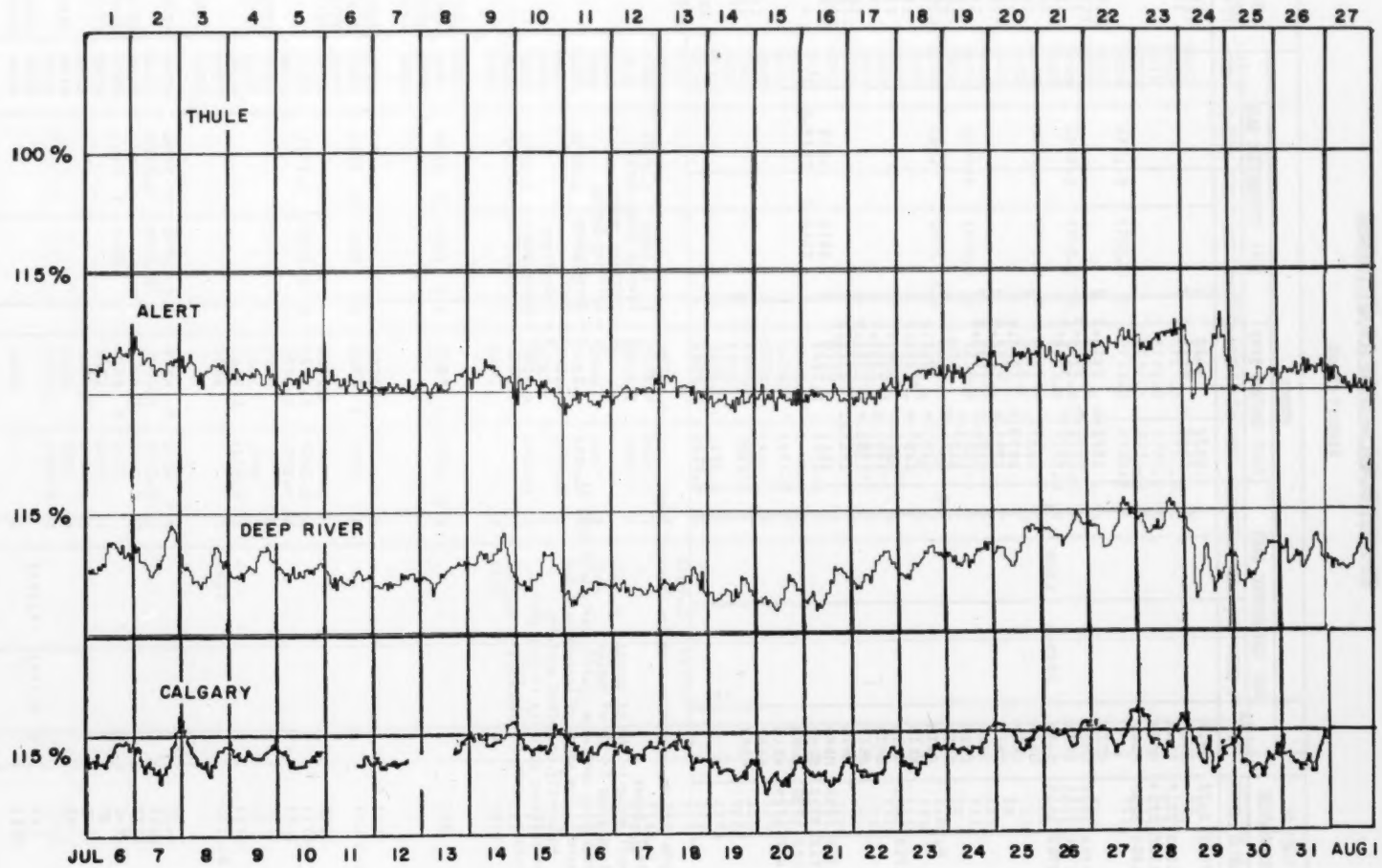
AUG 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
30	0837	1422	OWIN				0837	1422	1				IN
			OWIN				0845.9	0847.0	2				IIIG
	1010	2317	SGMR										
	1300	1759	HARV										
	1805	2245	HARV										
31			WEIS				1000.0	1013.0	2				IIIG
	0750	1421	OWIN				1000.5	1001.9	2				IIIG
	0744	1614	WEIS				1000.7	1001.8	1				IIIG
	0902	1619	OURN	1006.4	1008	1							DCIM
			OWIN				1007	1012	2				IIIG
			OWIN				1053.3	1053.4	1				IIIG
			OWIN				1201.8	1202.5	2				IIIG
			WEIS				1204.3	1205.0	2				IIIB
			OWIN				1213.1		2				IIIB
			OWIN				1214.0		2				IIIB
			OWIN				1247.4	1247.6	2				IIIG
			WEIS				1247.4	1248.7	2				IIIG
	0750	1421	OWIN				1248.6	1249.6	3				IIIG
			OWIN				1303.6	1304.0	2				IIIG
			WEIS				1303.8	1303.9	1				IIIG
			OWIN				1318.1	1318.2	1				IIIG
	1300	2245	HARV				1617	1619	3	1618	1619	3	IIIG,V
	1012	2315	SGMR							1618.0	1619.0	3	V
	1622	1755	OURN										
	1637	1729	WEIS										
			HARV				1917		2				IIIB
			HARV				2127		2				IIIB
													RS,I,DC

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

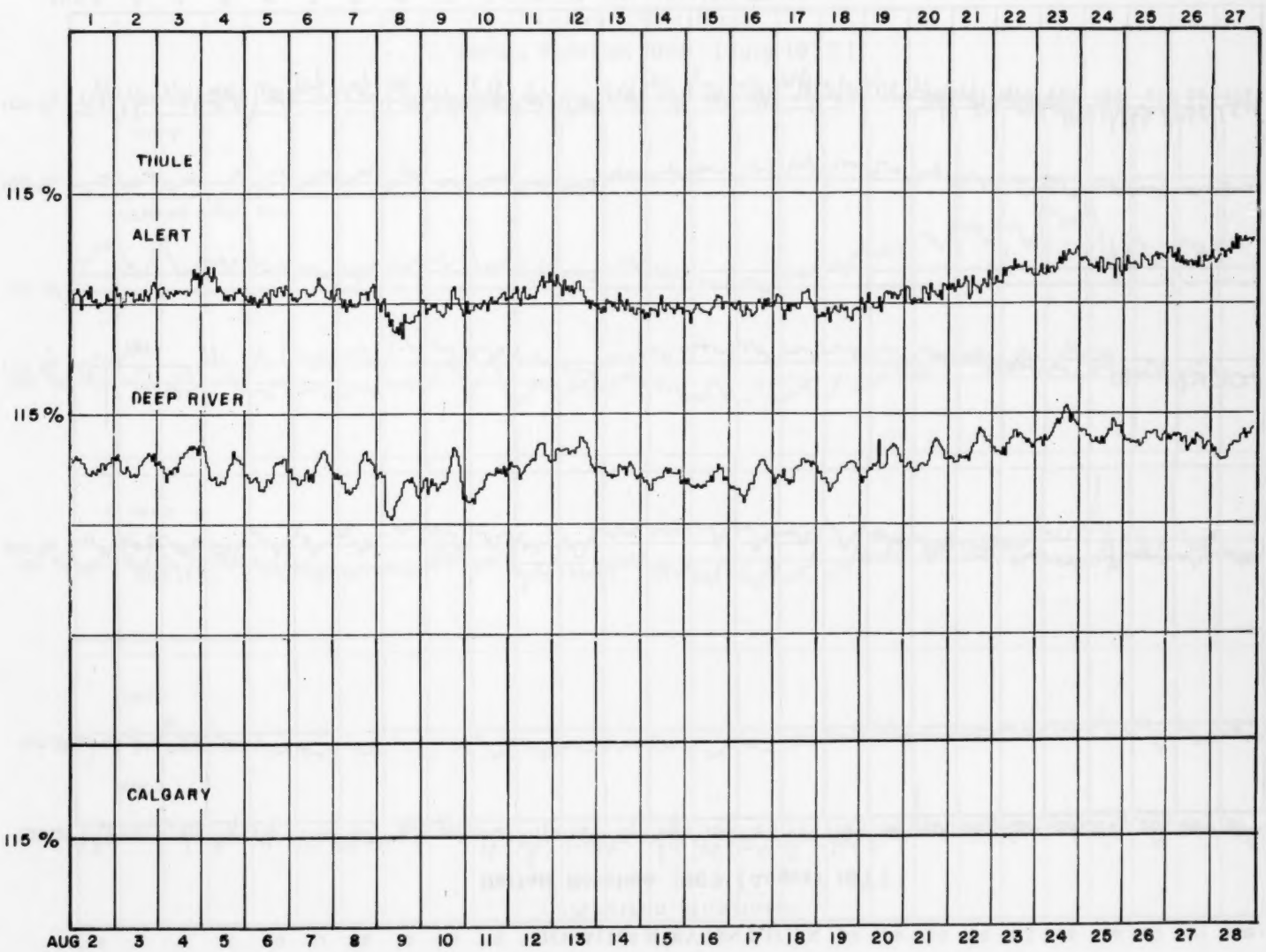
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1968 (July 1977)



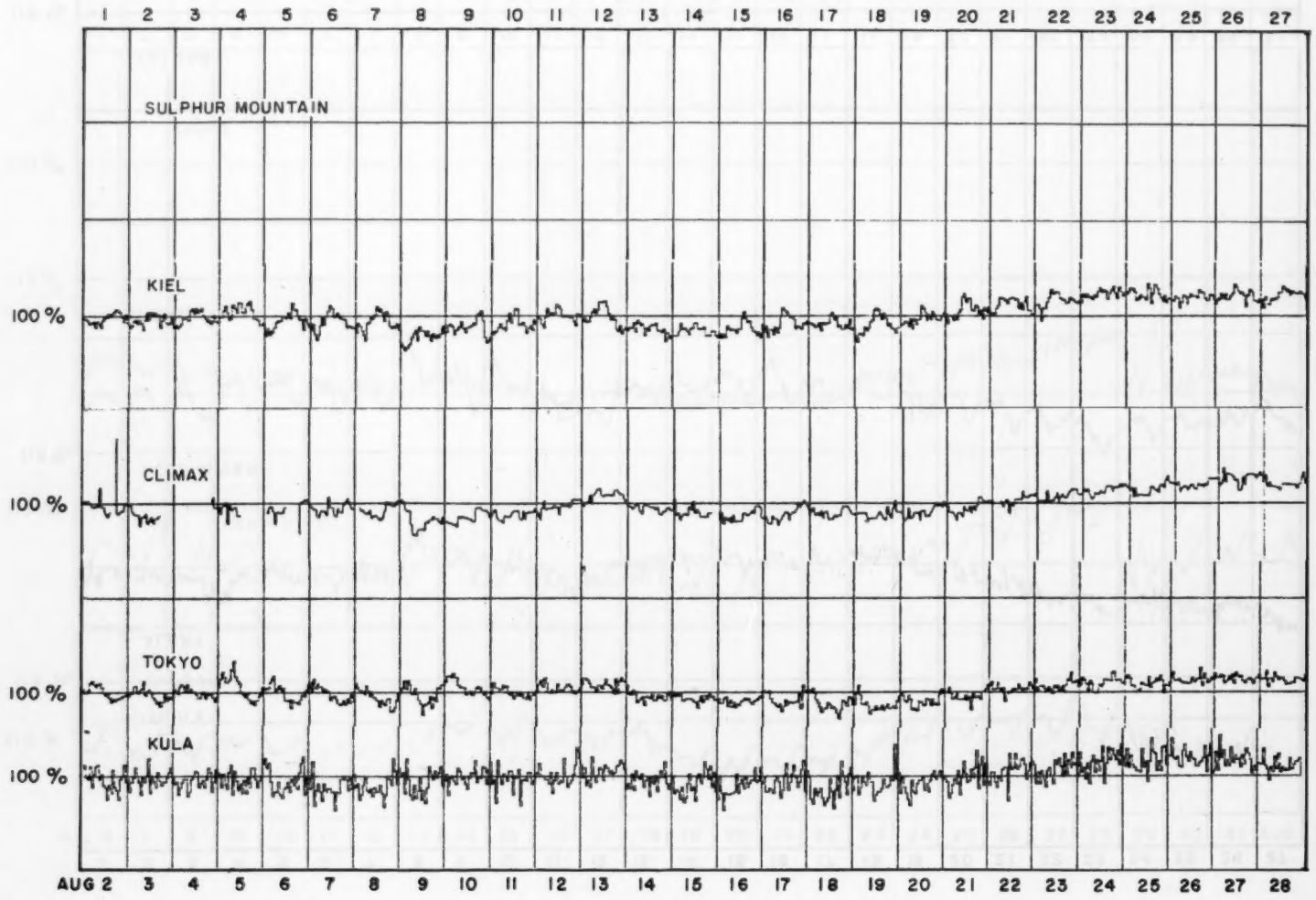
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1969 (August 1977)



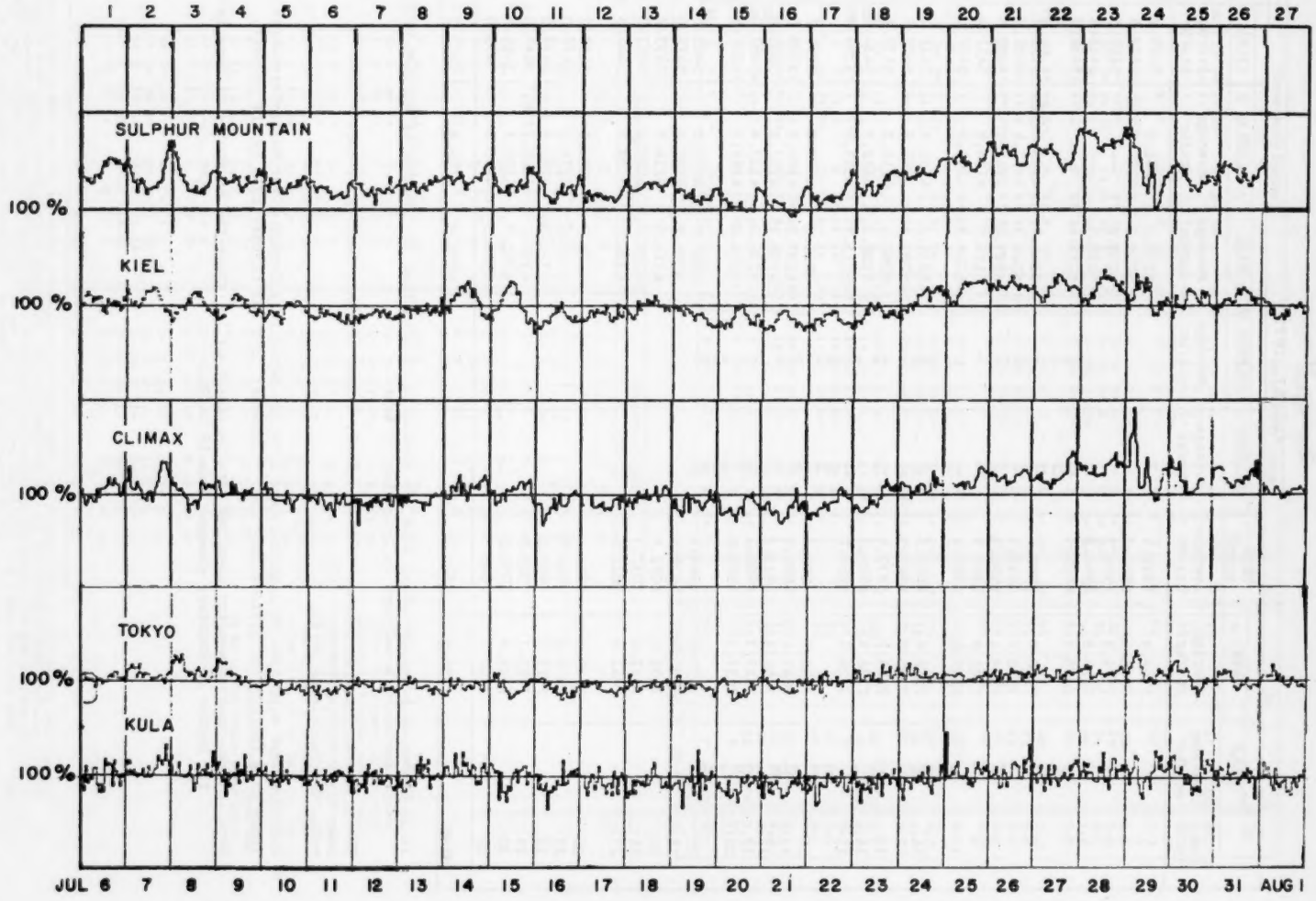
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1969 (August 1977)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1968 (July 1977)



COSMIC RAY INDICES

(Neutron Monitors)

AUGUST 1977

Aug. 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1	Data not available at time of publication.	7368.9	6951.1	Data not available at time of publication.	Data not available at time of publication.	6276.3	4201.0	5427.9	1208.6(23)
2		7363.1	6934.2			6255.7	4184.5(30)	5417.0	1206.9
3		7374.3	6935.3			6250.6	--	5410.5	1206.8
4		7390.8	6946.8			6258.5	--	5416.4	1205.5
5		7398.8	6926.3			6275.6	--	5432.0	1206.2
6		7370.8	6905.5			6246.7	4183.0(12)	5415.9	1206.3(23)
7		7378.7	6918.5			6244.7	4173.4	5411.0	1201.6
8		7363.4	6906.5			6243.0	4167.1	5402.6	1202.6(23)
9		7301.0	6857.9			6194.5	4134.8	5411.4	1205.3(23)
10		7338.6	6897.1			6226.8	4144.9	5432.0	1208.6(19)
11		7346.8	6882.5			6235.5	4153.9	5416.2	1207.3(21)
12		7385.0	6945.3			6263.7	4181.5	5428.5	1208.7(22)
13		7383.1	6970.4			6260.4	4214.2	5439.1	1211.5(22)
14		7336.5	6916.5			6220.3	4172.5	5430.8	1205.6(21)
15		7326.3	6898.0			6213.9	4159.0	5399.8	1202.9(22)
16		7332.7	6890.5			6221.2	4148.8	5391.2	1202.7(22)
17		7333.4	6889.5			6237.8	4154.5	5395.5	1205.3
18		7346.3	6915.2			6236.7	4157.5	5383.6	1200.7(20)
19		7317.3	6909.1			6234.3	4153.4	5381.0	1204.3(23)
20		7357.3	6940.5			6254.8	4164.8	5389.9	1204.6(20)
21		7373.0	6949.9			6283.1	4175.1	5405.8	1209.3(21)
22		7400.4	6976.0			6301.2	4202.4	5426.0	1212.3(21)
23		7439.9	6992.9			6314.5	4214.9	5435.2	1213.1
24		7467.0	7037.7			6337.4	4237.1	5443.8	1217.6(20)
25		7461.4	7018.8			6334.5	4239.0	5441.3	1218.4(22)
26		7473.5	7006.4			6325.3	4253.4	5452.2	1220.7
27		7478.0	7000.9			6329.6	4274.4	5456.0	1218.7
28		7515.0	6988.1			6331.3	4257.4	5452.5	1215.3(23)
29		7553.7	7029.9			6357.7	4265.7(36)	5465.0	1217.8(20)
30		7524.4	7063.9			6362.9	4290.1	5466.8	1219.3
31		7505.7	7008.5			6304.5	4245.1	5455.0	1216.4(23)
MEAN		7396.9	6948.7			6272.0	4196.6	5422.7	1209.4

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100.
Deep River Scaling Factor = 300.
Tokyo Scaling Factor = 128.

* Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967 - December 1970 and October 1975 to the present.

Note: Tokyo neutron monitor counting rate increased by 1.5 since the beginning of June 1977. The number of counters changed from 18 to 27.

GEOMAGNETIC ACTIVITY INDICES

AUGUST 1977

Day	Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *					Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M			
1	Q7	1+	2-	2-	2-	3-	2-	1-	1	12+	1+	2-	1+	1+	2+	1+	1	1	6	18	9	11	16	KC	0.3
2	Q2	2	1+	1-	1+	1-	1	1+	0+	9-	2-	1+	1	1+	1	1+	1	0+	4	12	6	10	8	CC	0.1
3	Q9A	1	1	1	1-	1+	2	3	3-	13-	1	1+	1+	1-	1+	2+	2+	2+	7	19	8	8	19	K	0.3
4		3-	3	1+	2	2-	2	3-	2	17+	2+	3	2-	2-	2-	2-	3-	2	9	25	12	17	21		0.5
5	Q1	4	4	6	5	5	4	5	3	36	3+	4-	5+	5-	4	4-	4	3	40	62	45	56	52		1.4
6		4-	4+	3+	3+	3-	3	4	4	28+	4	4	3+	4-	2+	3-	3+	4-	21	48	32	39	33		1.1
7		2+	3-	4-	4	2+	3+	2+	4	25-	3-	3	3+	4	3-	3	2+	4-	17	32	29	29	32		0.9
8		4-	3+	3-	2+	1+	2	3-	3	21	4-	3+	3-	2	2-	2	2+	3-	12	26	16	24	19		0.7
9		4	3	3-	2	5-	4-	4-	3	27-	4-	3+	3	2+	4-	3	3+	3-	20	41	29	29	42		1.0
10		3	3+	3+	2	2	2+	3-	2	21-	3	3+	3-	3-	2+	2	3-	3-	12	26	19	24	22		0.7
11	D3	3+	4+	4+	3+	4	3+	5	4+	32	3	4	4	3	3+	3	4-	3+	28	55	23	40	38		1.2
12		1+	3+	2+	4-	2+	2+	2	2+	20-	2-	3+	3-	3+	2	2	2-	2+	11	21	18	24	15		0.6
13		3	3-	2+	2	3-	2	2-	3+	20-	3-	3-	2+	2+	3	2-	2-	3-	11	25	16	19	23		0.6
14		1+	1-	2+	2+	4+	3-	3	2+	19	1	1-	3-	3-	4	2+	3-	2+	12	23	22	12	34		0.7
15		2+	4-	3+	3	2	1	2-	1+	18+	2+	3+	3	3	2	1+	2-	2-	11	26	15	28	13		0.6
16		1	2-	1	2-	4	2-	2+	2	15+	1+	2-	1-	1+	4-	2+	3-	2-	9	16	15	18	21		0.5
17	Q2	2	3	4	6-	5	4+	3	3+	30+	2	3-	4-	5-	4	4-	3-	3	29	40	43	42	41		1.3
18		4-	3-	3	2+	3-	3-	3-	2+	22	4-	2+	3-	3-	3	3-	3-	2-	13	24	22	23	23		0.7
19	D5	5	5-	2+	3+	2	3	3+	5-	28+	4+	4-	3-	3+	2+	3	3	4	24	38	39	41	36		1.2
20		3+	2	3-	2	2	2-	1+	1+	16+	2+	2	3-	2	2-	2-	1+	2-	8	21	14	22	14		0.5
21	Q3	1+	1	2+	1	1+	1	1-	1	10-	1+	1+	3-	2	2-	1-	1-	1+	5	12	10	12	11	CC	0.2
22	Q5	1-	1	1	1	0+	1-	2-	3-	9	1-	1-	1+	1	0+	1-	2-	2+	5	13	4	5	12	CC	0.2
23	Q8	1+	1-	1	2-	2-	3-	2+	2	13+	1+	1-	1-	2	2-	3	3-	2	6	18	8	9	17	C	0.3
24		2	3-	2+	3	3	3	1+	0+	18-	2+	3-	2	3-	3+	3-	1	0+	10	24	16	17	24		0.6
25	D4	1	1+	3+	5-	5+	5+	4-	3+	28	1	2	3-	4-	4	5-	3	3-	27	50	32	18	64		1.2
26		3	3-	3	3	4	2+	2-	0+	20	3-	2+	2+	3	3+	2+	2+	1-	13	29	13	23	20		0.7
27		2-	4-	4-	3+	2+	2+	3	2+	22+	1+	3	3	3+	2+	2+	3	2	14	31	16	25	23		0.8
28	Q0A	2-	3-	2	2-	2+	2	2	1-	15	1+	2+	2	2	2+	2-	2-	1	7	17	6	11	12	C	0.4
29	Q6	2+	2+	1+	2-	2	1-	1-	1-	12-	2	2	2-	2	2+	1-	1-	0+	6	14	9	12	11	CC	0.3
30	Q4	1	1+	2-	1	1	1+	2-	2-	11-	1	1+	2-	1	1	2	1+	2-	5	15	6	8	14	CC	0.2
31	Q1	1	2	1	1-	0+	1-	1-	1	7+	1	2-	1	1-	0+	1	0+	1	4	11	4	7	8	CC	0.1
																			13	26.5	18.0	22.4			0.64

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	1+	2-	2-	2-	3-	1+	1	1+	2-	2-	1+	1+	2+	1+	1	1-
2	2-	1+	1	2-	1+	1+	1+	0+	2-	2-	1	1+	1-	1	1	0+
3	1	1+	1+	1	2-	3-	3-	2+	1+	1+	1+	0+	1	2-	2	2
4	3-	3-	1+	2	2	2	3-	2	2+	3	2-	2-	1+	1	3	2
5	3+	4	5+	5	4	3+	4	3-	3+	4-	5+	5-	4	4-	4+	4-
6	3+	4+	3+	3+	3-	3	3	3+	4+	4	3	4-	2-	3-	3+	4-
7	2	3	4-	4-	3-	3+	2	3+	3	3	3+	4	2+	3	2+	4
8	3+	3+	3-	2+	2-	2+	3-	3-	4-	3+	3-	1+	1+	2-	2+	3-
9	4-	3+	3-	2+	4	3	3+	3	4	3	3	2+	3	3	3	3-
10	3-	4-	3-	3-	2+	2+	3-	2-	3+	3+	3-	2	2+	2	3-	3+
11	3	4	4-	3+	4-	4-	4	3+	3-	4	4	3	3	3-	3-	3
12	2-	3+	3-	4-	2	2+	2-	2+	2-	3+	3-	3+	2-	2-	2-	2
13	3-	3	2+	2+	3-	2-	2-	3	3-	3-	2+	2+	3	2-	2-	3-
14	1	1-	3-	3-	4	3-	3-	2	1+	1-	2+	3-	4+	2	3-	2+
15	2+	4-	3+	3	2+	1+	2-	1+	3-	3	3-	3	2-	1	2-	2-
16	1+	1+	1-	1+	4-	2	3-	2	1+	2-	0+	1	3+	2+	2+	1+
17	2-	3-	4+	5-	4+	4-	3-	3	2+	3-	3+	5-	4	4-	2+	3
18	3+	2+	3-	3-	3+	3-	3-	2+	4-	2+	3-	2+	3-	2+	3-	1+
19	4+	4	2+	3+	2+	3-	3-	4-	5-	4-	3-	3+	2+	3	3	4+
20	2+	2	3	2	2	2	1+	2-	3-	2	3-	2-	1+	1+	1+	2-
21	1	2	3-	2	2	1	1-	1+	2-	1	2	2-	2-	1-	1-	1+
22	1	0+	1+	1	0+	1	2	2	1-	1	1	1	0	1-	2-	2+
23	2-	1-	1	2+	2	3	2+	2-	1	1-	1-	2-	2-	3-	3-	2+
24	2+	3-	2	3-	3+	3	1+	0	2+	2+	2-	2	4-	3-	1-	0+
25	1-	2	3	4	4	4+	3	3-	1	2	3-	4-	4	5	3+	3-
26	3-	3-	2+	3	4-	2+	2+	1	3-	2	2+	3-	3	2+	2+	1-
27	2-	3+	3+	3+	2+	2+	3	2+	1+	3	3-	3	2+	2	3	2-
28	1+	3-	2+	2+	3-	2	2-	1+	1+	2+	2	1+	2-	2-	2-	1-
29	2	2	2-	2+	2+	1	0+	1-	2-	2	2-	1+	2+	1-	1-	0+
30	1-	1+	2	1+	1	2	1+	2	1+	1+	1+	1	1-	2-	1+	1+
31	1	2-	1+	1	1-	1	0+	1+	1	2-	1	0+	0+	1	1-	1

Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days [Q1-Q0(10)] and five most disturbed days [D1-D5] are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap <6 but one Kp >3o or two Kp values >3-"). An * means "not really disturbed" (Ap<20).

Georagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

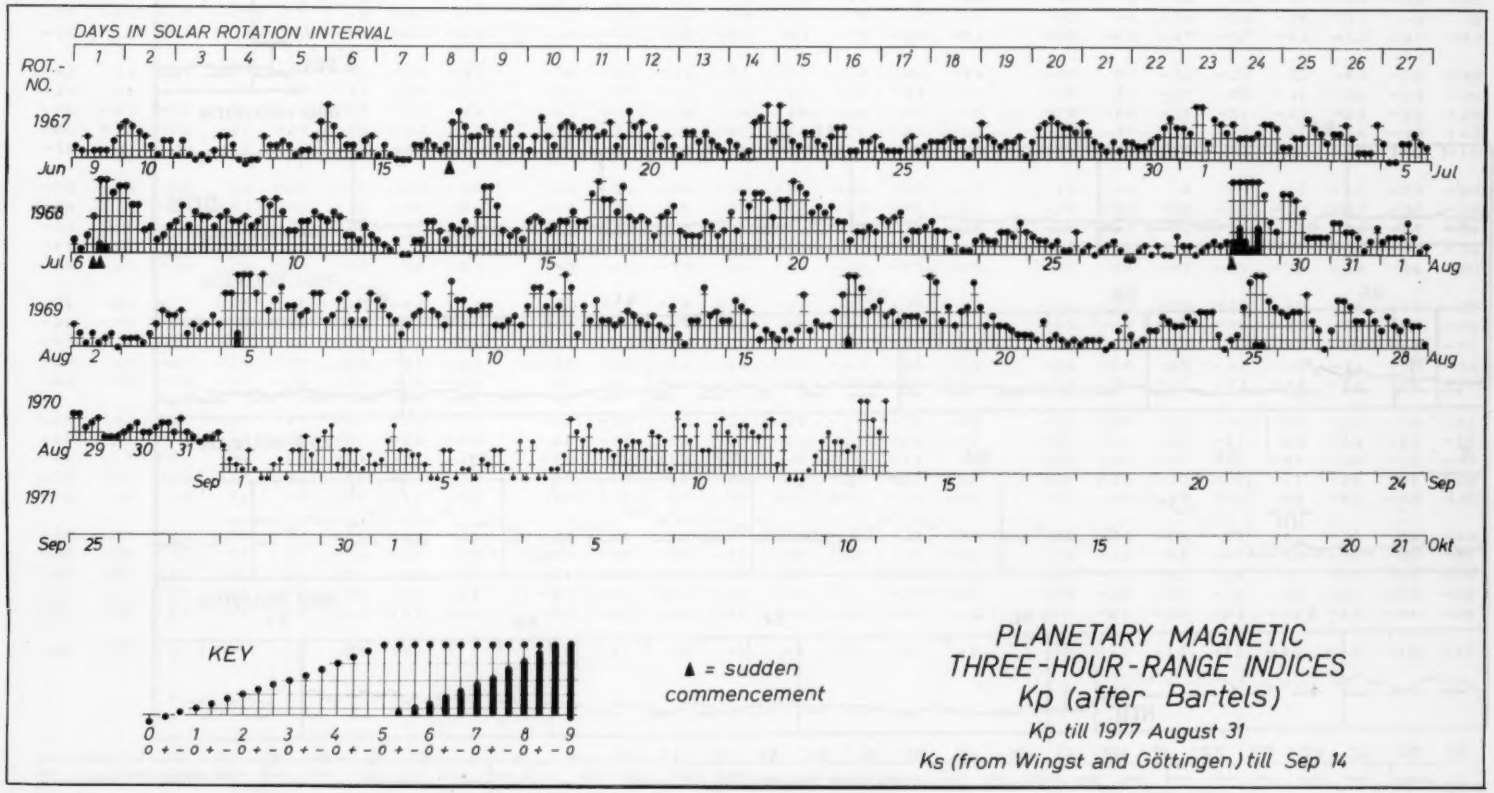
* Errata: Note that the N and M values of aa published in these tables for January 1974 through January 1977 values were slightly in error. The correct values (resulting in some modifications in the classification of the days C and K) were published in IAGA Bulletin No. 39 for 1974-75, and will be given in the Bulletin 32 series for 1976 through January 1977. The magnetic tape deposited in World Data Center A for Solar-Terrestrial Physics has been corrected.

DAILY AVERAGE INDICES Ap

	1976				1977							
DAY	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
1	10	14	10	7	17	7	11	4	13	9	15	6
2	24	21	7	3	5	21	5	5	66	14	11	4
3	10	9	6	4	6	11	4	12	15	6	9	7
4	14	6	4	15	10	4	3	24	19	5	8	9
5	9	13	3	6	15	9	4	12	11	7	5	40
6	7	11	2	3	10	14	6	49	10	5	28	21
7	10	6	3	10	7	18	5	48	6	6	15	17
8	7	6	6	23	6	18	12	27	3	6	14	12
9	6	6	8	16	6	25	38	22	7	6	16	20
10	5	6	18	13	3	12	19	13	9	8	14	12
11	4	8	23	13	14	13	18	14	24	4	10	28
12	8	14	24	15	12	7	22	8	19	4	4	11
13	5	8	31	8	7	12	13	5	6	6	9	11
14	10	7	16	4	18	11	12	12	8	9	18	12
15	10	33	9	2	13	8	5	10	14	3	12	11
16	6	29	5	8	7	6	6	17	22	10	27	9
17	10	30	7	10	6	9	9	9	18	8	14	29
18	33	19	5	28	10	17	11	8	11	10	7	13
19	20	7	9	7	8	6	5	48	5	10	23	24
20	51	7	7	5	12	5	13	28	10	11	29	8
21	24	7	4	4	5	7	10	12	4	6	10	5
22	17	5	5	8	7	8	7	6	7	10	11	5
23	12	6	4	5	6	18	14	5	7	10	6	6
24	7	6	3	6	8	14	12	11	8	7	7	10
25	24	5	11	9	9	11	12	22	5	5	5	27
26	13	4	9	6	4	8	16	4	2	6	3	13
27	12	7	8	6	4	3	8	4	4	7	3	14
28	5	5	2	6	13	7	15	4	7	12	4	7
29	10	3	6	45	15		14	18	2	7	61	6
30	9	16	11	13	30		5	8	5	9	17	5
31		34		12	19		4		7		8	4
MEAN	13	12	9	10	10	11	11	16	11	8	14	13

MEAN	13	12	9	10	10	11	11	16	11	8	14	13

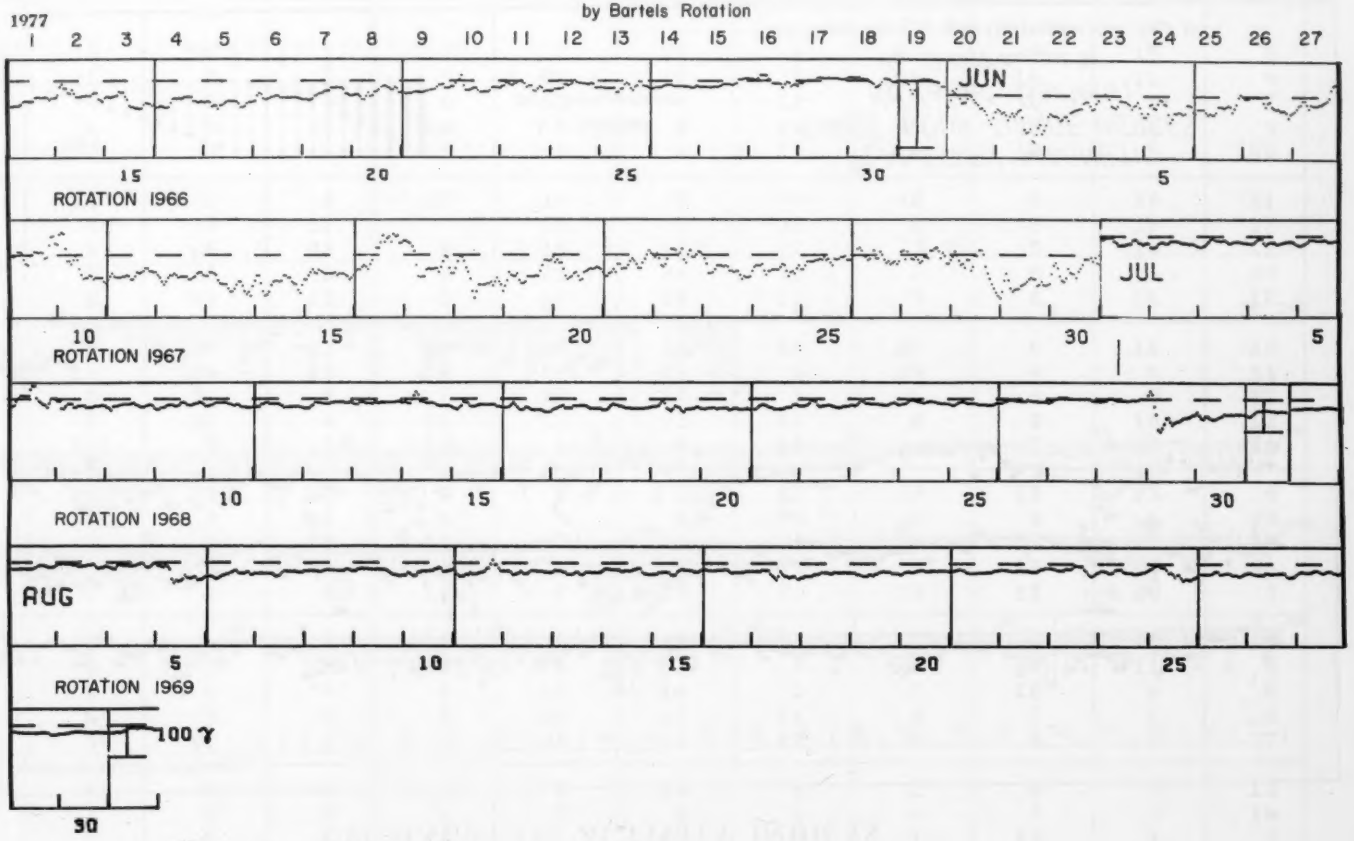
GEOMAGNETIC ACTIVITY INDICES


DAYS IN SOLAR ROTATION INTERVAL
ROT.-NO.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
1967
Jun 9 10 15 20 25 30 1 5 Jul
1968
Jul 6 10 15 20 25 30 31 1 Aug
1969
Aug 2 5 10 15 20 25 28 Aug
1970
Aug 29 30 31
Sep 1 5 10 15 20 24 Sep
1971
Sep 25 30 1 5 10 15 20 21 Okt
KEY
0 1 2 3 4 5 6 7 8 9
0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0
▲ = sudden commencement
PLANETARY MAGNETIC THREE-HOUR-RANGE INDICES
Kp (after Bartels)
Kp till 1977 August 31
Ks (from Wingst and Göttingen) till Sep 14

GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst

by Bartels Rotation



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

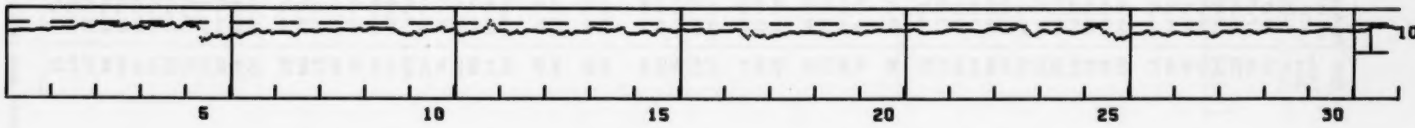
HOURLY EQUATORIAL DST VALUES (PROVISIONAL)

NASA/GODDARD SPACE FLIGHT CENTER

AUGUST 1977

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-35	-33	-30	-31	-32	-31	-30	-28	-28	-30	-30	-31	-32	-30	-29	-26	-26	-24	-27	-28	-28	-30	-27	-23
2	-20	-21	-25	-25	-23	-20	-20	-20	-20	-21	-24	-22	-18	-15	-11	-10	-9	-11	-13	-16	-17	-18	-14	-10
3	-6	-5	-4	-3	-6	-5	-9	-11	-12	-14	-15	-14	-12	-13	-9	-10	-7	-7	-16	-23	-17	-18	-13	-12
4	-17	-21	-24	-21	-12	-7	-10	-13	-13	-13	-14	-14	-11	-13	-7	-6	-2	-6	-14	-19	-15	-11	-4	-2
5	-12	-13	-16	-14	-8	-14	-25	-55	-66	-56	-62	-56	-51	-40	-50	-51	-50	-45	-47	-57	-53	-52	-48	-42
6	-42	-41	-40	-49	-54	-48	-44	-39	-38	-35	-36	-31	-29	-24	-28	-34	-37	-37	-33	-29	-33	-40	-38	-34
7	-34	-36	-35	-33	-33	-37	-37	-37	-39	-45	-43	-38	-31	-25	-27	-28	-29	-30	-27	-29	-32	-30	-29	-25
8	-25	-25	-24	-26	-29	-27	-31	-29	-25	-23	-21	-22	-24	-26	-27	-26	-28	-28	-27	-21	-20	-23	-28	-29
9	-26	-19	-20	-17	-20	-18	-23	-22	-22	-21	-19	-20	-23	-21	-21	-26	-31	-37	-39	-40	-41	-44	-40	-42
10	-38	-33	-36	-41	-43	-39	-30	-29	-25	-27	-25	-25	-24	-24	-20	-18	-14	-18	-28	-28	-25	-24	-22	-19
11	-29	-40	-45	-42	-41	-36	-39	-30	-37	-35	-34	-32	-30	-28	-25	-17	-15	-4	9	-9	-9	-17	-29	-28
12	-25	-27	-28	-33	-40	-36	-33	-31	-26	-36	-36	-33	-27	-23	-25	-27	-29	-28	-28	-31	-30	-33	-32	-28
13	-23	-27	-27	-28	-31	-32	-38	-35	-37	-33	-28	-31	-38	-39	-34	-28	-28	-31	-33	-31	-31	-30	-31	-24
14	-19	-17	-19	-22	-23	-23	-22	-23	-29	-28	-24	-23	-28	-24	-20	-19	-16	-16	-30	-37	-37	-38	-38	-38
15	-36	-35	-30	-30	-28	-30	-28	-33	-40	-40	-37	-30	-23	-19	-23	-25	-25	-26	-27	-31	-30	-28	-24	-20
16	-21	-24	-27	-25	-26	-23	-22	-21	-22	-21	-19	-21	-28	-34	-29	-29	-31	-29	-29	-28	-25	-28	-25	-25
17	-25	-25	-26	-26	-21	-22	-22	-26	-37	-42	-47	-54	-40	-25	-37	-43	-43	-47	-42	-40	-42	-52	-52	-45
18	-43	-40	-39	-42	-41	-36	-34	-34	-31	-27	-29	-28	-32	-34	-31	-27	-29	-28	-30	-29	-27	-29	-28	-29
19	-29	-32	-36	-37	-39	-42	-41	-39	-35	-36	-40	-33	-31	-27	-26	-24	-28	-26	-25	-32	-35	-31	-33	-38
20	-33	-28	-26	-25	-28	-27	-25	-23	-22	-21	-21	-24	-26	-24	-23	-22	-24	-24	-22	-23	-23	-22	-24	-27
21	-24	-23	-22	-20	-18	-20	-23	-29	-32	-34	-32	-31	-30	-29	-29	-29	-29	-28	-29	-28	-25	-22	-22	-21
22	-19	-20	-20	-22	-25	-27	-25	-25	-22	-23	-23	-23	-25	-27	-28	-29	-29	-26	-22	-17	-18	-15	-13	-14
23	-14	-17	-20	-24	-24	-24	-21	-16	-16	-19	-15	-10	-6	-9	-11	-8	-19	-27	-37	-42	-41	-36	-30	-27
24	-23	-22	-25	-28	-32	-31	-27	-20	-18	-18	-17	-27	-31	-28	-30	-32	-35	-35	-32	-30	-27	-28	-24	-20
25	-16	-13	-8	-5	-5	-12	-14	-14	-23	-32	-27	-36	-44	-35	-34	-47	-56	-49	-47	-53	-49	-45	-42	-38
26	-31	-32	-35	-35	-33	-35	-31	-26	-24	-24	-33	-31	-35	-29	-29	-34	-38	-38	-38	-42	-41	-36	-32	-30
27	-28	-29	-35	-37	-38	-36	-37	-38	-29	-33	-35	-33	-34	-31	-30	-31	-29	-32	-42	-46	-42	-42	-38	-34
28	-28	-25	-25	-28	-29	-31	-27	-23	-21	-21	-25	-30	-33	-27	-23	-23	-24	-31	-33	-36	-31	-27	-26	-25
29	-22	-19	-20	-23	-23	-25	-27	-27	-23	-24	-25	-25	-25	-24	-23	-22	-23	-24	-27	-32	-32	-31	-32	-27
30	-26	-27	-27	-24	-24	-22	-21	-19	-20	-20	-19	-21	-22	-23	-24	-24	-24	-21	-22	-23	-23	-23	-24	-24
31	-26	-25	-24	-21	-22	-22	-20	-17	-14	-11	-9	-9	-9	-12	-9	-9	-8	-10	-10	-11	-12	-16	-18	-18



PRINCIPAL MAGNETIC STORMS

AUGUST 1977

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
NE	55.1N	4	2131	..	..	..	..	05(3) 06(2)	6	49	142	232	08	09
JP	17.3N	4	23--	..	..	..	..			7	109	29	06	23
SH	14.6N	4	23--	..	..	..	..			7	127	30	06	23
UJ	13.5N	4	23--	..	..	..	..			6	121	29	06	23
AL	09.5N	4	23--	..	..	..	..	05(3)	6	4	122	34	06	23
HO	07.6N	4	1300	..	..	..	..	05(3)	6	5	141	21	07	00
AN	01.5N	4	23--	..	..	..	..			5	176	88	06	23
TV	01.2S	4	23--	..	..	..	..			5	212	140	06	23
CO	64.6N	5	00--	..	..	..	..	05(4)	7	142	1320	750	08	11
SI	60.0N	5	00--	..	..	..	..	05(4)	7	60	720	650	06	11
MI	54.2N	5	0040	..	..	..	..	05(3,4,5,7)	5	27	180	45	05	22
FR	49.6N	5	00--	..	..	..	..	05(3,4) 06(2) 07(4)	5	22	135	85	08	08
BO	48.9N	5	00--	..	..	..	..	05(4)	6	24	137	63	08	11
IR	41.0N	5	0100	..	..	..	..	05(3)	7	28	140	49	06	12
HO	21.1N	5	00--	..	..	..	..	05(3)	6	9	67	27	06	00
GU	04.0N	5	0018	..	..	..	..	05(3)	6	0	160	10	06	18
HU	00.6S	5	0134	..	..	..	..	05(5)	5	6	137	39	05	22
PH	18.7S	5	04--	..	..	..	..	05(3)	6	5	160	80	06	12
HR	33.7S	5	0000	..	..	..	..	05(3)	5	25	103	69	06	06
GN	43.3S	5	03--	..	..	..	..	05(3,5)	5	24	110	70	08	12
TO	46.7S	5	04--	..	..	..	..	05(3)	5	18	159	69	06	11
NE	55.1N	8	2021	SC	1	13	..	09(2,3) 10(2) 11(2,3)	5	34	129	148	13	24
JP	17.3N	9	14--	..	..	..	..			7	70	33	11	23
SH	14.6N	9	14--	..	..	..	..			6	74	37	11	23
UJ	13.5N	9	14--	..	..	..	..			7	72	27	11	23
AL	09.5N	9	14--	..	..	..	..	09(5,6) 10(2) 11(4,6,7,8)	6	7	58	29	11	23
HO	07.6N	9	1356	SC	- 0.4	+13	- 1	09(5,7) 11(6,7,8)	4	6	66	18	11	23
HU	00.6S	9	0429	..	..	..	..	09(5)	5	6	162	31	10	01
TV	01.2S	9	14--	..	..	..	..			4	91	55	11	23
CO	64.6N	11	01--	..	..	..	..	11(3)	6	98	1100	360	11	23
FR	49.6N	11	01--	..	..	..	..	11(3,7)	5	19	115	36	12	15
BO	48.9N	11	02--	..	..	..	..	11(3)	5	21	82	48	14	01
HO	21.1N	11	03--	..	..	..	..	11(6)	4	10	99	33	11	22
HU	00.6S	11	0220	..	..	..	..	11(6)	5	5	215	37	11	23
CO	64.6N	14	07--	..	..	..	..	14(5)	7	158	1430	470	14	15
BO	48.9N	14	07--	..	..	..	..	15(2)	5	20	69	34	15	14
NE	55.1N	16	2031	..	..	..	..	17(3,4,5) 19(1,2)	5	31	142	251	20	19
HO	07.6N	16	1300	..	..	..	..	17(4)	6	5	160	33	20	01
CO	64.6N	17	04--	..	..	..	..	17(4)	7	162	1450	910	19	14
SI	60.0N	17	06--	..	..	..	..	17(4)	7	60	--	630	17	23
BO	48.9N	17	03--	..	..	..	..	17(4)	5	23	107	80	20	16
IR	41.0N	17	0400	..	..	..	..	17(4)	6	18	135	61	18	20
JP	17.3N	17	04--	..	..	..	..			5	132	39	17	23
SH	14.6N	17	04--	..	..	..	..			5	158	37	17	23
UJ	13.5N	17	04--	..	..	..	..			4	146	39	17	23
AL	09.5N	17	04--	..	..	..	..	17(4)	6	4	129	29	17	23
GU	04.0N	17	0405	..	..	..	..	17(4)	5	0	110	20	18	09
AN	01.5N	17	04--	..	..	..	..			5	184	67	17	23
HU	00.6S	17	0332	..	..	..	..	17(5,6)	5	5	183	44	17	23
TV	01.2S	17	04--	..	..	..	..			2	207	113	17	23
PH	18.7S	17	05--	..	..	..	..	17(5)	5	4	120	40	18	08
TO	46.7S	17	07--	..	..	..	..	17(4)	5	17	110	41	19	14
CO	64.6N	25	07--	..	..	..	..	25(4,5,6)	6	136	910	580	25	22
NE	55.1N	25	0456	..	..	..	..	25(4)	5	26	80	97	29	15
BO	48.9N	25	04--	..	..	..	..	25(6)	5	21	101	40	28	07
IR	41.0N	25	0300	..	..	..	..	25(6)	6	24	80	31	26	18
JP	17.3N	25	07--	..	..	..	..			4	120	26	26	01
SH	14.6N	25	07--	..	..	..	..			4	105	20	26	01
UJ	13.5N	25	07--	..	..	..	..			3	132	20	26	01
AL	09.5N	25	07--	..	..	..	..	25(4,5,6)	5	4	125	15	26	01
HO	07.6N	25	0200	..	..	..	..	25(4,5,6)	5	3	137	13	25	21
AN	01.5N	25	07--	..	..	..	..			3	134	41	26	01
HU	00.6S	25	0248	..	..	..	..	25(5,6)	5	4	178	39	25	21
TV	01.2S	25	07--	..	..	..	..			2	143	79	26	01
TO	46.7S	25	05--	..	..	..	..	25(6)	5	18	75	23	25	19

Reports were received from the following observatories:

Alibag Annamalainagar Boulder College Fredericksburg Gnangara Guam Hermanus Honolulu Huancayo Hyderabad Irkutsk Jaipur Kerguelen Newport Port Moresby San Juan Shillong Sitka Toolangi Trivandrum Ujjain Witteveen

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

AUGUST 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana).
The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

none

Solar-flare effects (sfe)

none

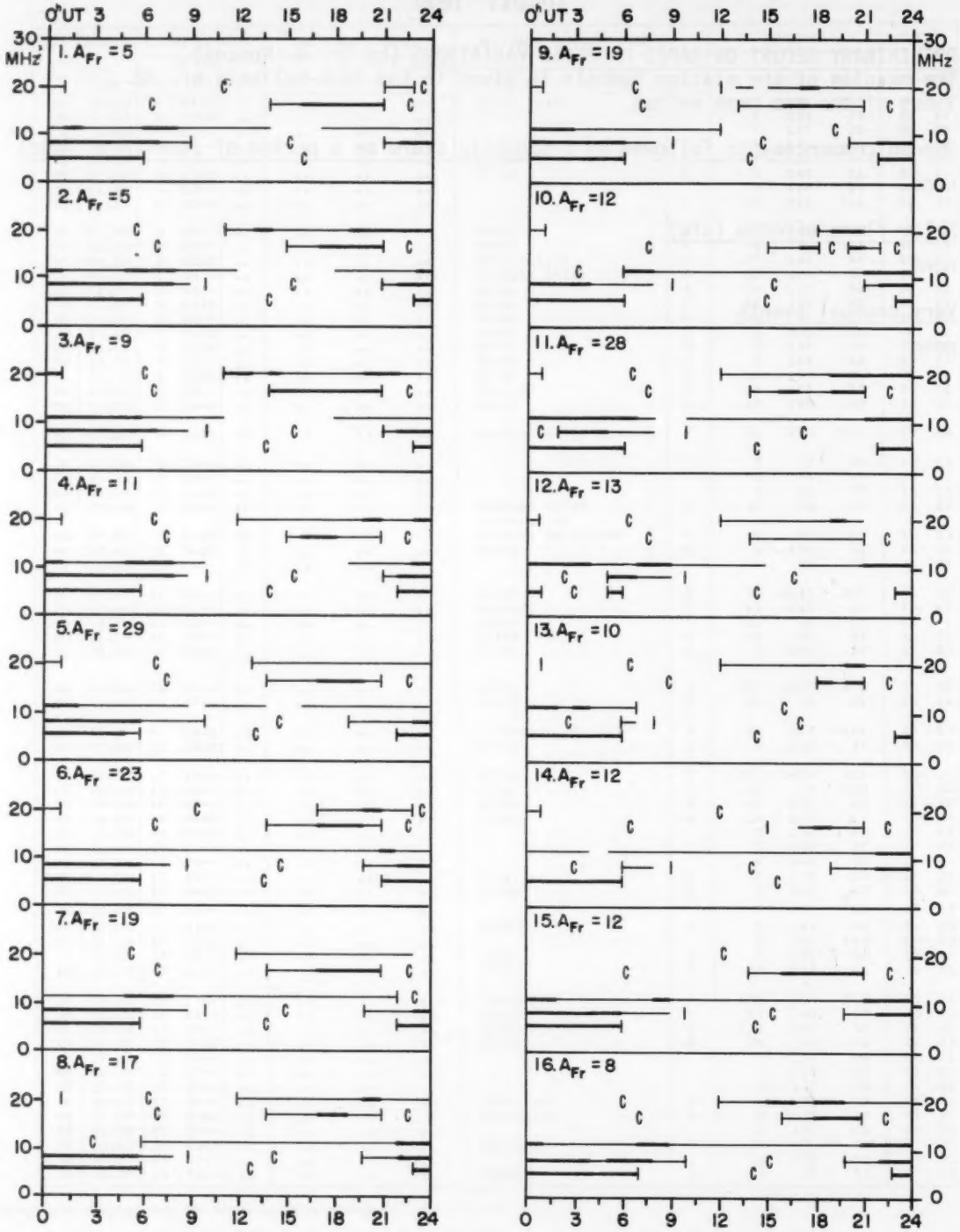
Very unusual events

none

Jaipur

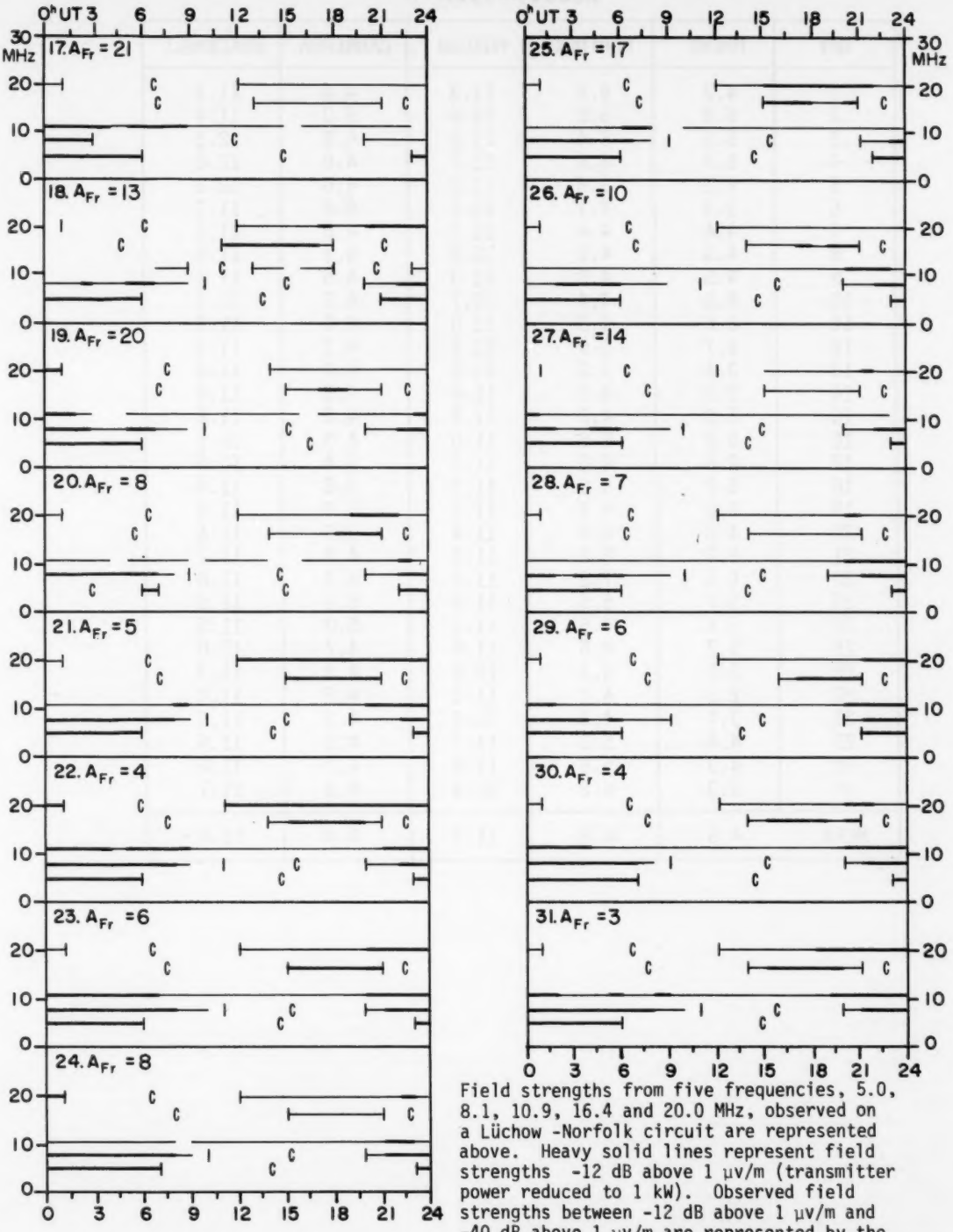
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

AUGUST 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

AUGUST 1977



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

AUGUST 1977

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	4.2	4.8	11.3	4.4	11.3
2	6.8	5.0	11.6	5.0	11.4
3	5.6	5.4	11.4	4.6	12.1
4	6.5	4.4	11.7	4.8	12.0
5	4.1	3.6	11.3	4.6	12.2
6	3.3	4.1	11.1	4.6	11.7
7	4.4	4.4	11.2	4.5	11.5
8	4.5	4.0	10.9	4.3	11.5
9	4.5	4.3	11.0	4.5	11.0
10	4.6	4.4	10.7	4.2	11.4
11	3.6	4.3	11.0	4.6	11.9
12	4.7	5.0	11.1	4.1	11.3
13	3.4	5.0	11.3	4.0	11.6
14	3.8	4.3	11.4	4.5	11.9
15	5.0	4.8	11.2	4.2	11.6
16	5.6	5.0	11.0	4.3	11.7
17	2.9	4.3	11.3	3.4	11.6
18	5.2	5.0	11.3	3.6	11.4
19	3.6	4.8	11.1	3.5	11.6
20	4.8	4.8	11.4	3.5	11.6
21	6.2	6.6	11.3	4.8	11.7
22	5.5	7.2	11.3	4.3	11.8
23	5.7	5.6	11.8	5.1	11.6
24	5.4	4.6	11.7	5.0	11.5
25	3.7	4.5	11.9	4.7	12.0
26	2.9	4.3	10.9	4.1	11.3
27	2.3	4.1	11.2	4.2	11.8
28	3.4	4.3	11.4	4.3	11.8
29	4.4	5.3	11.7	4.5	11.6
30	4.9	5.5	11.4	4.7	11.6
31	5.3	6.2	11.4	4.3	11.7
MEAN	4.5	4.8	11.3	4.4	11.6

USCOMM-NOAA-ASHEVILLE,N.C. -11-1-77-950

October 1977 Number 398-Part II

P-A STACKS

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Data for April 1977–March 1977 & Miscellanea

Explanation of Data Reports Issued as Number 390 (Supplement) February 1977

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To standardize referencing these reports in the open literature, the following format is recommended:

Solar-Geophysical Data, 390 Part I (or Part II), pages, February 1977, U.S. Department of Commerce, (Boulder, Colorado, U.S.A. 80302).

SOLAR - GEOPHYSICAL DATA

No. 398

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar - Terrestrial Data Services Division

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Note: A = Part I, B = Part II.

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ACTIVE REGIONS

CARRINGTON ROTATION 1653

(March 23 - April 20, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1652	Activity at West Limb
	Lat.	Long.					
1	43°S	334°	-3	1	x		disappeared
2	21 N	312	0	1	x		decreasing
3	17 S	305	>6	1	x		disappeared
4	15 N	263	+3	1	x		disappeared
5	26 N	258	>6	1	x		decreasing
6	29 N	250	>6	1	x	(4)	decreasing
7	19 N	244	-4	1	x		stable
8	35 N	150	0	1	x		disappeared
9	26 N	143	-4	1	x		decreasing
10	32 N	138	>6	1	x		dispersed
11	0	134	>6	1	x		dispersed
12	25 S	73	-5	1	x		stable
13	25 S	60	0	2			decreasing
14	26 N	50	0	1	x		disappeared
15	25 N	46	-1	1	x		disappeared
16	20 S	27	>6	4			decreasing
17	22 S	16	>6	1	x		decreasing

ACTIVE REGIONS

CARRINGTON ROTATION 1654

(April 20 - May 17, 1977)

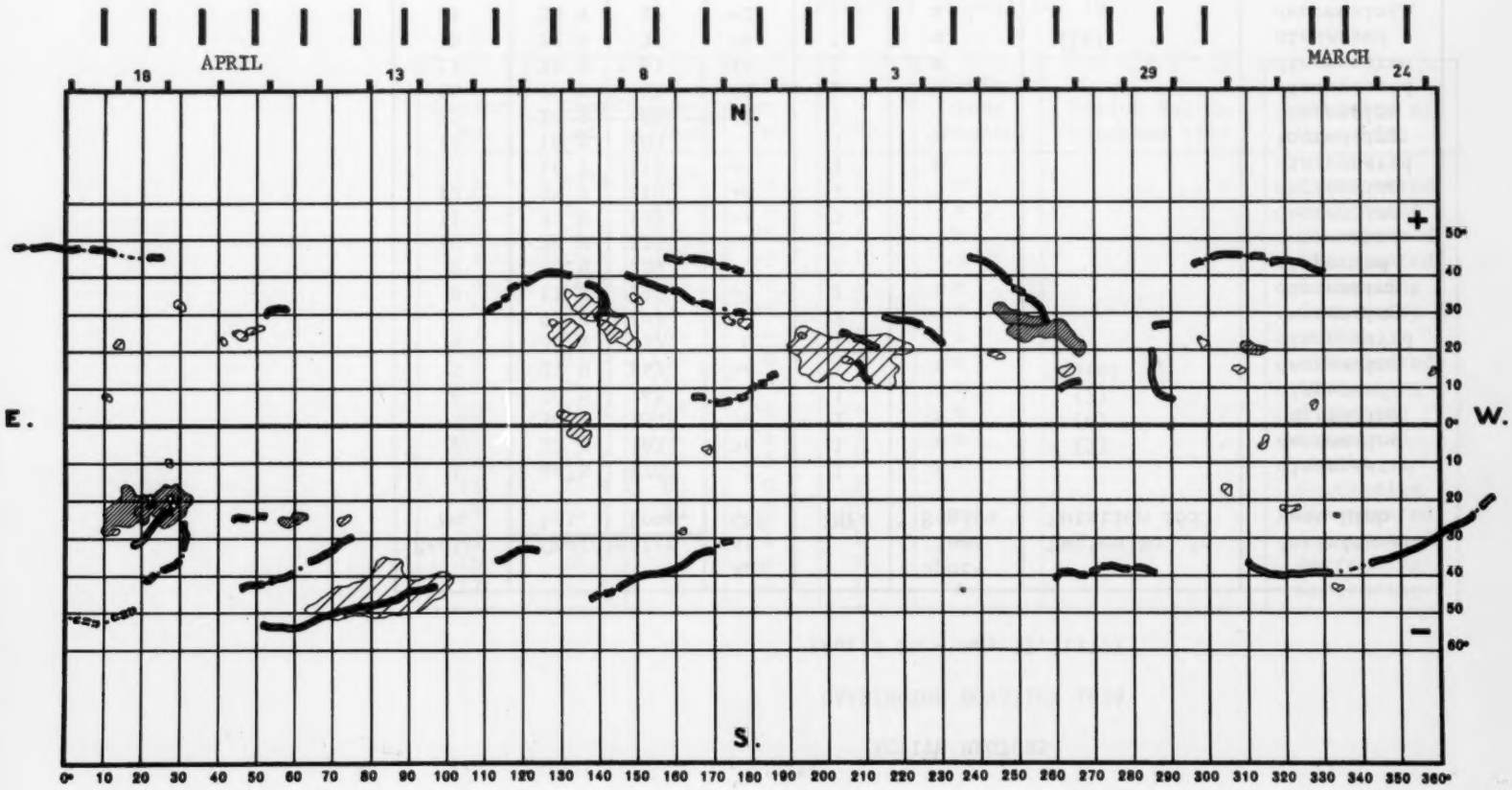
Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1653	Activity at West Limb
1	44°S	270°	-2	1	x		disappeared
2	23 N	261	>6	1	x	(5)	decreasing
3	30 N	254	>6	1	x	(6)	decreasing
4	20 N	245	>6	1	x	(7)	dispersed
5	27 N	242	>6	1	x	(5+6)	decreasing
6	34 N	227	0	1	x		disappeared
7	23 S	198	>6	2			decreasing
8	11 S	193	+3	1	x		decreasing
9	25 N	139	0	2			dispersed
10	20 N	128	-2	2			decreasing
11	32 N	128	>6	3			decreasing
12	35 N	118	+6	2			decreasing
13	16 S	112	+3	1	x		disappeared
14	16 N	108	-4	1	x		increasing
15	24 S	66	+1	2			decreasing
16	19 N	65	+4	1	x		disappeared
17	26 S	61	+4	1	x		disappeared
18	22 S	31	>6	1	x	(16)	dispersed
19	30 N	19	+2	1	x		decreasing
20	21 S	17	>6	3			decreasing
21	28 S	10	>6	1	x	(17)	decreasing
22	22 S	3	+3	1	x		dispersed
23	36 N	3	-4	2			increasing

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1653

MARCH 23 TO APRIL 20, 1977

MEUDON OBSERVATORY

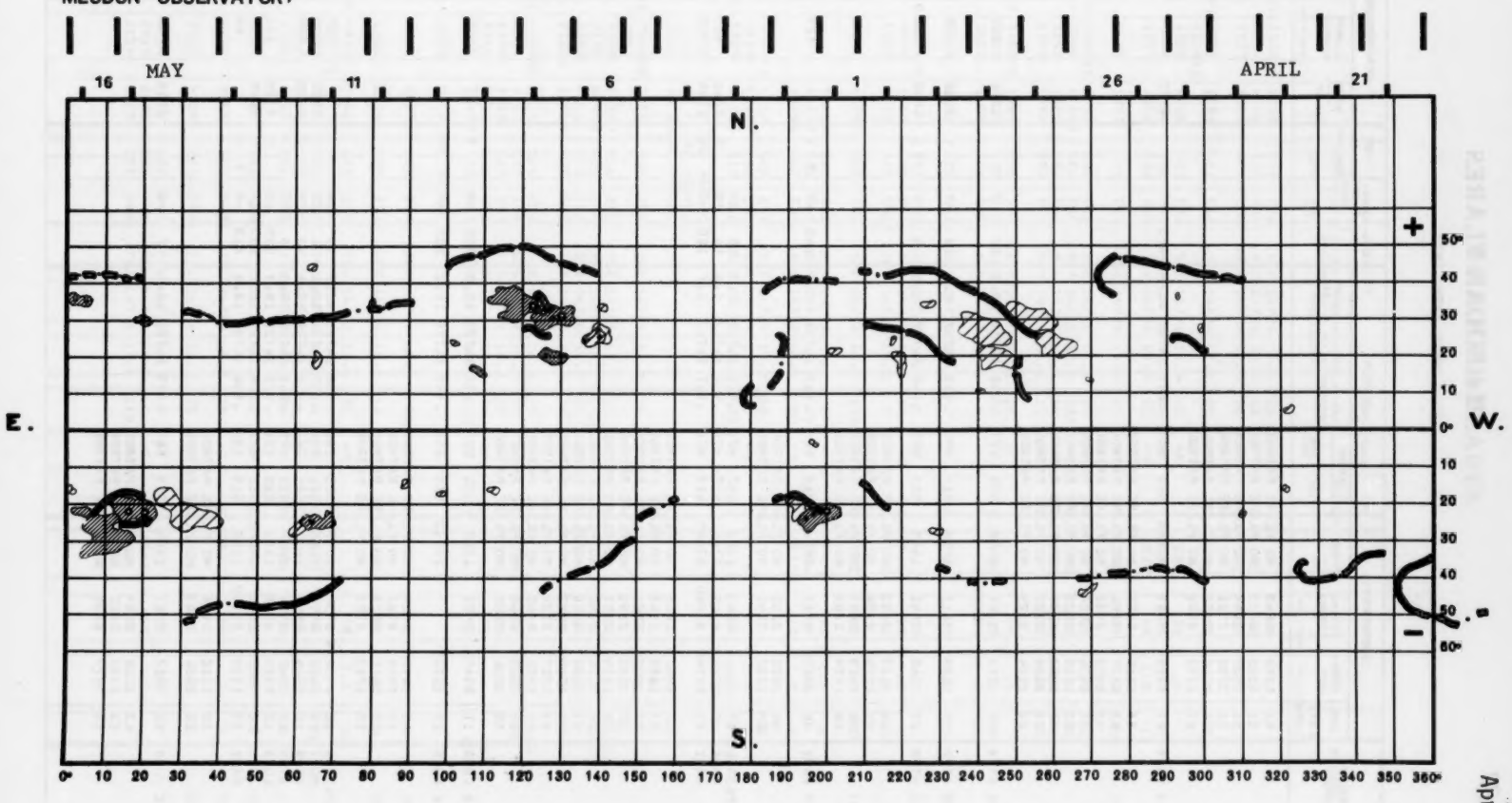


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1654

APRIL 20-MAY 16, 1977

MEUDON OBSERVATORY



7 Apr 77

Hα SOLAR FLARES

APRIL 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX LONG. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
	01	0000	0043	NO FLARE PATROL														
	01	0201	0232	NO FLARE PATROL														
	01	1937	2148	NO FLARE PATROL														
	01	2200	2210	NO FLARE PATROL														
	02	2150	2152	NO FLARE PATROL														
	03	0750	0800	NO FLARE PATROL														
843 CATA	03	0800E	0800	0815D	N23	W33	.691	14701	31.9	15D	-F	2		0800	84	1.2		Y5
	03	0815	0825	NO FLARE PATROL														
	03	0835	0850	NO FLARE PATROL														
	03	0920	0930	NO FLARE PATROL														
	03	0950	1000	NO FLARE PATROL														
	03	1015	1025	NO FLARE PATROL														
	03	1203	1208	NO FLARE PATROL														
	03	2018	2107	NO FLARE PATROL														
	03	2114	2129	NO FLARE PATROL														
844 CATA	04	1215	1220	1240	N30	E77	.990	14713	10.3	25	F	2		1220	112			Y5
	IMP.1 NO # LVOV1																	
845 HTPR	05	1608	1611	1618	N19	W52	.840	14717	1.8	10	-F		C	1611	20	.3		Y5
846 HTPR	05	1640	1642	1645	N19	W52	.840	14717	1.8	5	-F		C	1642	30	.4	E	Y5
	05	2113	2133	NO FLARE PATROL														
	05	2225	2234	NO FLARE PATROL														
	06	1629	1653	NO FLARE PATROL														
	06	1659	1705	NO FLARE PATROL														
847 RAMY	06	2007E	2010	2021	N18	W68	.947	14717	1.7	14D	-F	3	C		127		DE	Y5
	06	2055	2102	NO FLARE PATROL														
	07	0237	0245	NO FLARE PATROL														
GRP63848	07	0246	0249	0302	N17	W71	.961	14717	1.8	16	1N						DH	
KODA	07	0246	0249	0300	N15	W70	.954	14717	1.9	14	1N		P	0246	405	4.2	CDH	
MANI	07	0254E	0254U	0304D	N19	W72	.967	14717	1.7	10D	-F		V	0254	80	1.8		
	07	0950	1045	NO FLARE PATROL														
	07	1050	1145	NO FLARE PATROL														
	07	1949	2021	NO FLARE PATROL														
	07	2101	2109	NO FLARE PATROL														
	08	1859	2057	NO FLARE PATROL														
	08	2114	2142	NO FLARE PATROL														
	09	0358	0400	NO FLARE PATROL														
	09	0500	0503	NO FLARE PATROL														
	09	0707	0730	NO FLARE PATROL														
	09	0930	0940	NO FLARE PATROL														
	09	2039	2106	NO FLARE PATROL														
	10	0726	0826	NO FLARE PATROL														
849 LOCA	11	0945E	0950	1020	S21	E88	.998	14726	18.0	35D	-N		V					Y5
850 KHAR	11	1103E		1123D	S19	E90	.999	14726	18.2	20D	-F		P					Y5
	11	1817	1825	NO FLARE PATROL														
	12	0500	0502	NO FLARE PATROL														
	12	0600	0618	NO FLARE PATROL														
	12	0703	0758	NO FLARE PATROL														
GRP63851	12	0932>9	0950+8	1037	S21	E82	.986	14726	18.5	65	1B				160		E	
MONT	12	0932	0950	1033	S21	E86	.995	14726	18.8	61	2B		C	0950	400			
HTPR	12	0944	0958	1027	S21	E82	.986	14726	18.6	43	1B		C	0958	150		E	
ATHN	12	0947	0951	0955	S23	E75	.961	14726	18.0	8	1B		V					
LOCA	12	0955E	0955	1050	S20	E78	.973	14726	18.3	55D	2B		C	0955	163	8.8		
ZURI	12	1026E	1026	1036D	S21	E82	.986	14726	18.6	10D	1N		P	1026	60			
RAMY	12	1029E	1030U	1150	S15	E85	.994	14726	18.8	81D	-F	3	C		96			
	12	1812	1826	NO FLARE PATROL														
	12	2051	2103	NO FLARE PATROL														
852 VORO	12	2317	2319	2324	S19	E69	.929	14726	18.1	7	-N		C	2319	45			Y5
	13	0200	0209	NO FLARE PATROL														
	13	0550	0612	NO FLARE PATROL														
	13	0627	0636	NO FLARE PATROL														

Hα SOLAR FLARES

APRIL 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
GRP63853	13	1130+1	1133+2	1146	S21	E66	.910	14726	18.4	16	-F				40			
HTPR	13	1130	1135	1150	S22	E67	.917	14726	18.5	20	-F		C	1135	40	1.0		
MONT	13	1131	1133	1141	S21	E66	.910	14726	18.4	10	-F		C	1133	40			
GRP63854	13	1216>9	1220 1239+1	1251	S21	E66	.910	14726	18.5	35	-N				50		É	
HTPR	13	1216	1220	1256	S22	E66	.911	14726	18.5	40	-F		C	1220	30	.7		
MONT	13	1227	1240	1251	S21	E66	.910	14726	18.5	24	-N		C	1240	60		E	
MCMA	13	1237	1239	1250	S21	E66	.910	14726	18.5	13	-N		C	1239	40	1.0	E	
855 MCMA	13	1317	1320	1328	S19	E63	.888	14726	18.3	11	-N		C	1320	30	.7	DH	Y5
GRP63856	13	1339+4	1346+1	1358	S21	E62	.882	14726	18.2	19	-N				40	.9	EH	
MONT	13	1339	1346	1400D	S21	E65	.903	14726	18.4	21D	-N		C	1346	60		E	
HTPR	13	1342	1347	1356	S21	E61	.874	14726	18.1	14	-F		C	1347	20	.4	E	
MCMA	13	1343	1347	1358	S20	E60	.865	14726	18.1	15	-N		C	1347	40	1.0	EH	
GRP63857	13	1449+2	1452+2	1505	S21	E60	.866	14726	18.1	16	-F				25	.5		
HTPR	13	1449	1454	1512	S22	E60	.867	14726	18.1	23	-F		C	1454	20	.4	D	
MCMA	13	1451	1452	1457	S21	E60	.866	14726	18.1	6	-F		C	1452	30	.6	E	
858 HTPR	13	1513	1514	1520	S21	E62	.882	14726	18.3	7	-F		C	1514	10	.2	D	Y5
GRP63859	13	1535+0	1538+0	1544	S21	E63	.889	14726	18.4	9	-F				30	.7		
HTPR	13	1535	1538	1545	S21	E64	.896	14726	18.4	10	-N		C	1538	30	.7	E	
MCMA	13	1535	1538	1542	S21	E62	.882	14726	18.3	7	-F		C	1538	30	.7	D	
860 MCMA	13	1550	1552	1604D	S21	E62	.882	14726	18.3	14D	-N		C	1552	40	.9	EH	Y5
GRP63861	13	1612		1615D	S21	E61	.874	14726	18.2	3	-F				50	1.1	E	
HTPR	13	1612		1614D	S21	E63	.889	14726	18.4	2D	-F		C	1614	30	.7		
MCMA	13	1613E		1615D	S22	E59	.858	14726	18.1	2D	-N		P	1613	70	1.5	E	
GRP63862	13	1715	1728+1	1815	S20	E61	.873	14726	18.3	60	-N						Z	
MCMA	13	1715	1728	1815	S21	E61	.874	14726	18.3	60	-B		C	1728	50	1.1	E	
RAMY	13	1727E	1729	1736D	S20	E62	.881	14726	18.4	9D	-F	2	C		128		Z F	
	13	1926	1950	NO FLARE PATROL														
	13	2038	2046	NO FLARE PATROL														
	13	2104	2130	NO FLARE PATROL														
GRP63863	13	2130+0	2132+0 2208	2255	S20	E58	.848	14726	18.2	85	1N				130	2.5	E	
PALE	13	2130	2132	0008	S21	E59	.858	14726	18.3	150	1N	3	V		132		DEDE	
PALE	13	2130	2132	2144D	S21	E59	.858	14726	18.3	14D	1N	3	C		132		DEDE	
VORO	13	2205	2208	2244	S19	E57	.838	14726	18.2	39	1B		C	2226	206	4.1	E	
PALE	13	2216E	2220U	2255D	S21	E59	.858	14726	18.4	37D	-F	3	C		41		DE	
GRP63864	13	2332+2	2339+5	2359	S21	E57	.840	14726	18.3	27	1N						EKU	
VORO	13	2332	2341	0002	S19	E57	.838	14726	18.3	30	1B		C	2338	251	5.0	EK	
CULG	13	2333	2339	2358	S23	E57	.843	14726	18.3	25	-N		C	2339	100	1.8		
PALE	13	2334	2344	2359	S21	E58	.849	14726	18.3	25	2F	3	C		379		UDE	
PALE	13	2334	2344	2349D	S21	E58	.849	14726	18.3	15D	2F	3	V		379		UDE	
	14	0600	0609	NO FLARE PATROL														
865 UPIC	14	0650E		0655U	S22	E53	.806	14726	18.3	5D	-F		P	0650	41		B	Y5
866 MCMA	14	1254	1255	1304	S20	E48	.752	14726	18.1	10	-F		C	1255	20	.3	D	Y5
GRP63867	14	1611+6	1617 1623+1	1646	S21	E50	.774	14726	18.4	35	-N				70	1.1	EL	
MCMA	14	1611	1623	1650	S21	E47	.743	14726	18.2	39	-N		C	1623	50	.7	EL	
HTPR	14	1617	1617	1621	S20	E55	.821	14726	18.8	4	-F		C	1617	20	.3		
HTPR	14	1618	1624	1642	S21	E50	.774	14726	18.4	24	-N		C	1624	100	1.3	E	
868 MCMA	14	1831	1834	1858	S21	E46	.732	14726	18.2	27	-N		C	1834	70	1.1	E	Y5
869 MCMA	14	2020	2030	2040	S21	E45	.721	14726	18.2	20	-F		C	2030	50	.7	E	Y5
870 MCMA	14	2105	2108	2135	S21	E45	.721	14726	18.3	30	-B		C	2108	80	1.2	E	Y5
GRP63871	14	2211	2214+1	2228	S22	E45	.724	14726	18.3	17	-F				50	.7	F	
CULG	14	2211	2215	2230	S23	E44	.716	14726	18.2	19	-F		C	2215	40	.6		
MANI	14	2214E	2214U	2225	S21	E46	.732	14726	18.4	11D	-N		V	2214	70	1.0	F	

Hα SOLAR FLARES

APRIL 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
GRP63872	15	0153	0156+4	0222	S23	E43	.706	14726	18.3	29	-F				70	1.0	R	
PALE	15	0153	0156	0214	S22	E42	.691	14726	18.2	21	-F	3	C		60		DE R	
CULG	15	0157E	0200	0229	S24	E44	.720	14726	18.4	32D	-F		P	0200	80	1.3		
GRP63873	15	0851+6	0856+5	0930	S20	E38	.637	14726	18.2	39	1N						E	
HTPR	15	0851	0856	0948	S21	E40	.665	14726	18.4	57	-N		C	0856	70	.8	E	
TEHR	15	0857	0901	0916	S20	E36	.613	14726	18.1	19	1N	3	C		350		DE	
LOCA	15	0905E		0930	S18	E37	.618	14726	18.2	25D	1F		S				B	
874 MONT	15	1041	1056	1111	S22	E46	.735	14726	18.9	30	-F		C	1056	60		E	Y5
GRP63875	15	1519+0	1520	1535	S20	E34	.588	14726	18.2	16	-F						EL	
			1528															
MCMA	15	1519	1528	1538D	S21	E33	.580	14726	18.1	19D	-F		C	1528	50	.6	EL	
HTPR	15	1519	1520	1532	S20	E35	.601	14726	18.3	13	-F		C	1520	20	.2		
876 HTPR	15	1601	1609	1619	S19	E33	.571	14726	18.1	18	-F		C	1609	20	.2		Y5
GRP63877	15	1652	1704	1742	S19	E33	.571	14726	18.2	50	-F				40	.5	EL	
			1731															
HTPR	15	1652		1744D	S19	E33	.571	14726	18.2	52D	-F		C	1732	30	.3	E	
MCMA	15	1655E		1720D	S20	E34	.588	14726	18.3	25D	-N		C	1658	50	.6	EL	
HTPR	15	1659	1704	1717	S19	E34	.584	14726	18.3	18	-F		C	1704	30	.3	E	
RAMY	15	1726E	1731U	1740	S18	E33	.566	14726	18.2	14D	-F	3	C		60		FDE	
878 MCMA	15	1801E		1825	S20	E34	.588	14726	18.3	24D	-F		C	1803	60	.8	E	Y5
	15	1950	1958	NO FLARE PATROL														
	15	2007	2010	NO FLARE PATROL														
	15	2040	2152	NO FLARE PATROL														
879 VORO	16	0219	0221	0238	S19	E28	.506	14726	18.2	19	-B		C	0221	54	.6	DJ	Y5
880 HTPR	16	0711	0714	0735	S22	E35	.610	14726	18.9	24	-F		C	0714	30	.3	E	Y5
GRP63881	16	0717+8	0731+1	0827	S21	E26	.493	14726	18.3	70	-N						E	
			0810															
ATHN	16	0717	0731	0820	S21	E22	.444	14726	18.0	63	1N		V		229			
HTPR	16	0725	0732	0827	S21	E26	.493	14726	18.3	62	-N		C	0732	60	.6	E	
CATA	16	0740E	0810	0830D	S22	E32	.574	14726	18.7	50D	-N	2		0810	84	1.1		
GRP63882	16	1141+2	1144+4	1220	S19	E23	.440	14726	18.2	39	-N				50	.6	E	
HTPR	16	1141	1145	1220	S20	E23	.448	14726	18.2	39	-B		C	1145	50	.5	E	
MONT	16	1141	1144	1222	S19	E25	.467	14726	18.4	41	-N		C	1144	60		E	
RAMY	16	1141	1148U	1157D	S18	E21	.407	14726	18.1	16D	1N	2	C		206		FDE	
MEUD	16	1143	1145	1200	S20	E23	.448	14726	18.2	17	-N		C	1145	50	.6	E	
GRP63883	16	1722		1757	S19	E20	.402	14726	18.2	35	-N				110	1.2		
HTPR	16	1722		1747D	S19	E20	.402	14726	18.2	25D	-B		C	1728	150	1.5	E	
PALE	16	1730E	1730U	1757	S19	E20	.402	14726	18.2	27D	-F	3	C		72		FDE	
GRP63884	16	2109+0	2115+0	2141D	S20	E20	.410	14726	18.4	32	1N				300	3.3		
PALE	16	2109	2115	2141	S19	E18	.376	14726	18.2	32	1N	3	C		315		FDE	
PALE	16	2109	2115	2129D	S19	E18	.376	14726	18.2	20D	1N	3	V		289		FDE	
CULG	16	2129E		2212	S23	E25	.496	14726	18.8	43D	-N		P	2145	140	1.6		
GRP63885	16	2307+0	2315+3	0042	S21	E18	.396	14726	18.3	95	1B						F	
			2432															
MITK	17	0026E	0032	0042	S22	E19	.418	14726	18.4	16D	-N		C	0032	70	.8		
PALE	16	2307	2316	0150	S21	E18	.396	14726	18.3	163	2B	3	C		554		DE F	
MANI	16	2307E	2318U	2335D	S21	E17	.384	14726	18.2	28D	-N		V	2318	120	1.3	F	
CULG	16	2311E	2315	0030	S22	E19	.417	14726	18.4	79D	1B		P	2315	200	2.2		
MITK	16	2325E		0004D	S20	E17	.374	14726	18.3	39D	1N		C	2325	270	3.1	F	
886 PALE	17	0255E	0258	0318	S21	E17	.385	14726	18.4	23D	-F	3	C		40			Y5
GRP63887	17	1040	1047+3	1120	S20	E11	.310	14726	18.3	40	1N				270	2.8	FS	
			1059															
CATA	17	1040	1050	1106D	S20	E10	.300	14726	18.2	26D	1N	1		1050	224	2.4		
ATHN	17	1044E	1047	1130	S18	E13	.306	14726	18.4	46D	1B		V		328			
TEHR	17	1050	1059	1116	S21	E10	.314	14726	18.2	26	1N	3	C		318		F S	
UPIC	17	1115E		1120U	S21	E11	.323	14726	18.3	5D	-F		P	1115	61		B	
	17	1940	2113	NO FLARE PATROL														

Hα SOLAR FLARES

APRIL 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP63888	17	2210+2	2213+1	2227	S22	E08	.313	14726	18.5	17	-N				90	1.0	F
MANI	17	2210E	2213	2227	S20	E07	.276	14726	18.4	17D	-N		V	2213	100	1.6	F
CULG	17	2211	2213	2239	S24	E10	.356	14726	18.7	24	-N		C	2213	80	.9	
PALE	17	2212	2214	2220	S21	E07	.292	14726	18.5	8	-F	3	C		79		
	18	1609	1610	NO FLARE PATROL													
	18	1625	1635	NO FLARE PATROL													
	18	1645	1727	NO FLARE PATROL													
	18	1738	1758	NO FLARE PATROL													
889 MCMA	18	1801E		1814D	S22	E01	.286	14726	18.8	13D	-F		C	1803	40	.4	E Y5
	18	1953	1955	NO FLARE PATROL													
	18	2112	2159	NO FLARE PATROL													
GRP63890	19	0722+3	0739 0747+0	0757	S21	W09	.308	14726	18.6	35	1N				230	2.5	E
HTPR	19	0722		0729D	S21	W09	.308	14726	18.6	7D	-F		C	0726	20	.2	
BUCA	19	0725		0801	S22	W09	.323	14726	18.6	36	1N		C	0742	322	3.5	E
MITK	19	0735	0739	0753	S22	W08	.316	14726	18.7	18	-N		C	0739	140	1.5	E
CATA	19	0740E	0747	0815D	S21	W09	.308	14726	18.6	35D	1B	2		0747	281	3.0	
ATHN	19	0740E	0747	0750	S20	W15	.354	14726	18.2	10D	-N		V		180		
891 LVOV	19	1456	1511	1524D	S20	W17	.377	14726	18.3	28D	1N		C	1511	350	3.9	E Y5
	19	1524	1558	NO FLARE PATROL													
GRP63892	19	1604E	1626	1630D	S21	W18	.398	14726	18.3	26	-F						L
MCMA	19	1604E		1629D	S22	W18	.409	14726	18.3	25D	-N		P	1608	100	1.1	EL
RAMY	19	1623E	1626U	1630D	S20	W18	.388	14726	18.3	7D	-F	3	C		95		FDE
	19	1630	1646	NO FLARE PATROL													
	19	1919	2110	NO FLARE PATROL													
GRP63893	20	0046E		0156	S21	W22	.447	14726	18.4	7D	-N						EJ
MITK	20	0046E		0200D	S23	W22	.465	14726	18.4	74D	-F		C	0055	4	.5	
VORO	20	0113		0151	S20	W22	.439	14726	18.4	38	1N		C	0128	197	2.2	EJ
894 MITK	20	0610	0613	0627	S21	W21	.435	14726	18.7	17	-N		C	0613	60	.7	E Y5
GRP63895	20	1634+3	1641+2	1705D	S22	W31	.564	14726	18.4	31	-N				60	.7	HL
MCMA	20	1634E	1641	1705D	S22	W30	.552	14726	18.4	31D	-B		C	1641	60	.7	EFHL
RAMY	20	1637	1643	1650D	S22	W31	.564	14726	18.4	13D	-N	3	C		190		FDE
HTPR	20	1637	1643	1657D	S21	W33	.583	14726	18.2	20D	-F		C	1643	50	.5	E
	20	1730	1740	NO FLARE PATROL													
	20	1755	1801	NO FLARE PATROL													
	20	1815	1837	NO FLARE PATROL													
	20	1841	1935	NO FLARE PATROL													
	20	2052	2105	NO FLARE PATROL													
GRP63896	21	0826+2	0835+0	0844	S20	W40	.664	14726	18.4	18	-N				110	1.5	E
MONT	21	0826	0835	0900	S19	W40	.661	14726	18.4	34	-N		C	0835	150		E
ZURI	21	0827	0835	0843	S21	W39	.656	14726	18.4	16	-N		C	0835	110	1.6	
HTPR	21	0828	0830	0842	S22	W39	.660	14726	18.4	14	-F		C	0830	10	.1	
HTPR	21	0831	0835	0840	S19	W42	.685	14726	18.2	9	-F		C	0835	10	.1	
HTPR	21	0831	0835	0844	S23	W40	.676	14726	18.4	13	-F		C	0835	10	.1	
GRP63897	21	1344>9	1349+2 1400	1402	S22	W32	.577	14726	19.2	18	-N						
MONT	21	1344	1349	1402	S21	W34	.596	14726	19.0	18	-N		C	1349	80		D
HTPR	21	1348	1351	1400	S20	W32	.566	14726	19.2	12	-N		C	1351	20	.2	
RAMY	21	1356	1400	1402D	S24	W31	.578	14726	19.3	6D	-N	3	C		48		FDE
898 HTPR	21	1424	1426	1427	S18	W44	.705	14726	18.3	3	-F		C	1426	10	.1	Y5
899 MONT	21	1443	1448	1451	S21	W34	.596	14726	19.1	8	-F		C	1448	20		D Y5
900 HTPR	21	1511	1515	1524	S20	W33	.579	14726	19.2	13	-F		C	1515	20	.2	Y5
GRP63901	21	1527+5	1530 1536+6	1550	S18	W44	.705	14726	18.3	23	-N				70	1.0	H
HTPR	21	1527	1530	1536	S20	W45	.722	14726	18.3	9	-F		C	1530	10	.1	
LOCA	21	1532	1536	1549	S18	W43	.694	14726	18.4	17	1N		V	1536	163	2.3	H
HTPR	21	1534	1539	1550	S18	W45	.717	14726	18.3	16	-N		C	1539	70	.7	
RAMY	21	1537E	1542	1549D	S18	W45	.717	14726	18.3	12D	-N	3	C		51		DE H

Hα SOLAR FLARES

APRIL 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
902 HTPR	21	1627	1630	1651	S20	W34	.591	14726	19.1	24	-N		C	1630	60	.6	Y5
903 PALE	21	1831	1832	1833	S21	W48	.756	14726	18.2	2	-F	3	C		20		H Y5
904 RAMY	21	2035E	2040	2045D	S18	W47	.739	14726	18.3	10D	-N	3	C		86		DE H Y5
GRP63905	22	0128	0129	0140	S20	W50	.775	14726	18.3	12	-N				80	1.3	E
MITK	22	0128	0129	0139	S22	W50	.779	14726	18.3	11	-N		C	0129	110	1.8	E
MANI	22	0132E	0132	0140	S19	W50	.773	14726	18.3	8D	-F		P	0132	5	.8	
GRP63906	22	0901+0	0905 0917	0921	S22	W43	.706	14726	19.2	20	-F						D
HTPR	22	0901	0917	0925	S22	W42	.695	14726	19.2	24	-F		C	0917	20	.2	
MONT	22	0901	0905	0917	S22	W44	.717	14726	19.1	16	-F		C	0905	20		D
907 HTPR	22	0931	0934	0938	S22	W42	.695	14726	19.2	7	-F		C	0934	10	.1	Y5
GRP63908	22	1008+0	1016+0	1033	S21	W43	.703	14726	19.2	25	-F				15	.2	DHK
HTPR	22	1008	1016	1022	S22	W42	.695	14726	19.3	14	-F		C	1016	10	.1	
MONT	22	1008	1016	1044	S21	W44	.714	14726	19.1	36	-F		C	1016	20		DHK
909 CATA	22	1225	1225	1230	S22	W46	.738	14726	19.1	5	-F	2		1225	28	.4	Y5
GRP63910	22	1230>9	1243+2	1301	S22	W47	.749	14726	19.0	31	-F				60	.9	
CATA	22	1230	1245	1305	S22	W48	.759	14726	18.9	35	-N	2		1245	84	1.3	
ZURI	22	1243	1243	1257	S23	W47	.752	14726	19.0	14	-F		C	1243	50	.8	
GRP63911	22	1404>9	1412+3	1438	S20	W51	.785	14726	18.8	34	-F				45	.7	E
HTPR	22	1404	1412	1440	S20	W51	.785	14726	18.8	36	-F		C	1412	30	.3	E
CATA	22	1415	1415	1435	S20	W51	.785	14726	18.8	20	-N	2		1415	56	.9	
912 HTPR	22	1622		1653D	S20	W52	.795	14726	18.8	31D	-F		C	1631	30	.3	Y5
	22	2138	2142	NO FLARE PATROL													
GRP63913	23	0152+1	0157+0	0211	S21	W64	.899	14726	18.3	19	-F				45	1.1	E
MITK	23	0152	0157	0211	S22	W64	.899	14726	18.3	19	-N		C	0157	50	1.2	E
CULG	23	0153	0157	0211	S20	W65	.905	14726	18.2	18	-F		C	0157	40	.9	
	23	1332	1340	NO FLARE PATROL													
	23	1345	1355	NO FLARE PATROL													
	23	1435	1445	NO FLARE PATROL													
	23	1550	1600	NO FLARE PATROL													
	23	1605	1610	NO FLARE PATROL													
	23	2041	2100	NO FLARE PATROL													
	24	2115	2124	NO FLARE PATROL													
	24	2141	2154	NO FLARE PATROL													
	24	2200	2225	NO FLARE PATROL													
	24	2232	2245	NO FLARE PATROL													
	25	0209	0215	NO FLARE PATROL													
	25	0233	0243	NO FLARE PATROL													
	25	0301	0303	NO FLARE PATROL													
	25	1737	1749	NO FLARE PATROL													
	25	1804	1830	NO FLARE PATROL													
	25	1838	1928	NO FLARE PATROL													
	25	1933	1944	NO FLARE PATROL													
	25	1959	2124	NO FLARE PATROL													
914 MONT	26	0928	0933	0948	S19	E80	.982	14742	2.4	12	-F		C	0933	20		Y5
915 MONT	26	1146	1154	1206D	S23	E63	.998	14742	2.7	20D	-F		C	1154	60		E Y5
	26	1959	2012	NO FLARE PATROL													
	26	2044	2122	NO FLARE PATROL													
	26	2153	2210	NO FLARE PATROL													
	27	0030	0052	NO FLARE PATROL													
	27	0104	0110	NO FLARE PATROL													
	27	1921	1943	NO FLARE PATROL													
	27	1958	2132	NO FLARE PATROL													
	28	1530	1552	NO FLARE PATROL													
	28	1702	1914	NO FLARE PATROL													
	28	1951	2011	NO FLARE PATROL													
	28	2107	2131	NO FLARE PATROL													
	29	0135	0140	NO FLARE PATROL													
	29	2058	2104	NO FLARE PATROL													
	29	2114	2136	NO FLARE PATROL													

Hα SOLAR FLARES

APRIL 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE 1977 APR	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
916 MONT	30	0944	0957	1004	N34	E90	1.001	14749	7.2	20	-F		C	0957	40		D	Y5
917 MONT	30	1009	1012	1019	N34	E90	1.001	14749	7.2	10	-F		C	1012	20			Y5
918 MONT	30	1113	1117	1124	S23	E27	.531	14742	2.5	11	-F		C	1117	40			Y5

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

APRIL 1977

DAILY FLARE INDICES

Includes all Flares

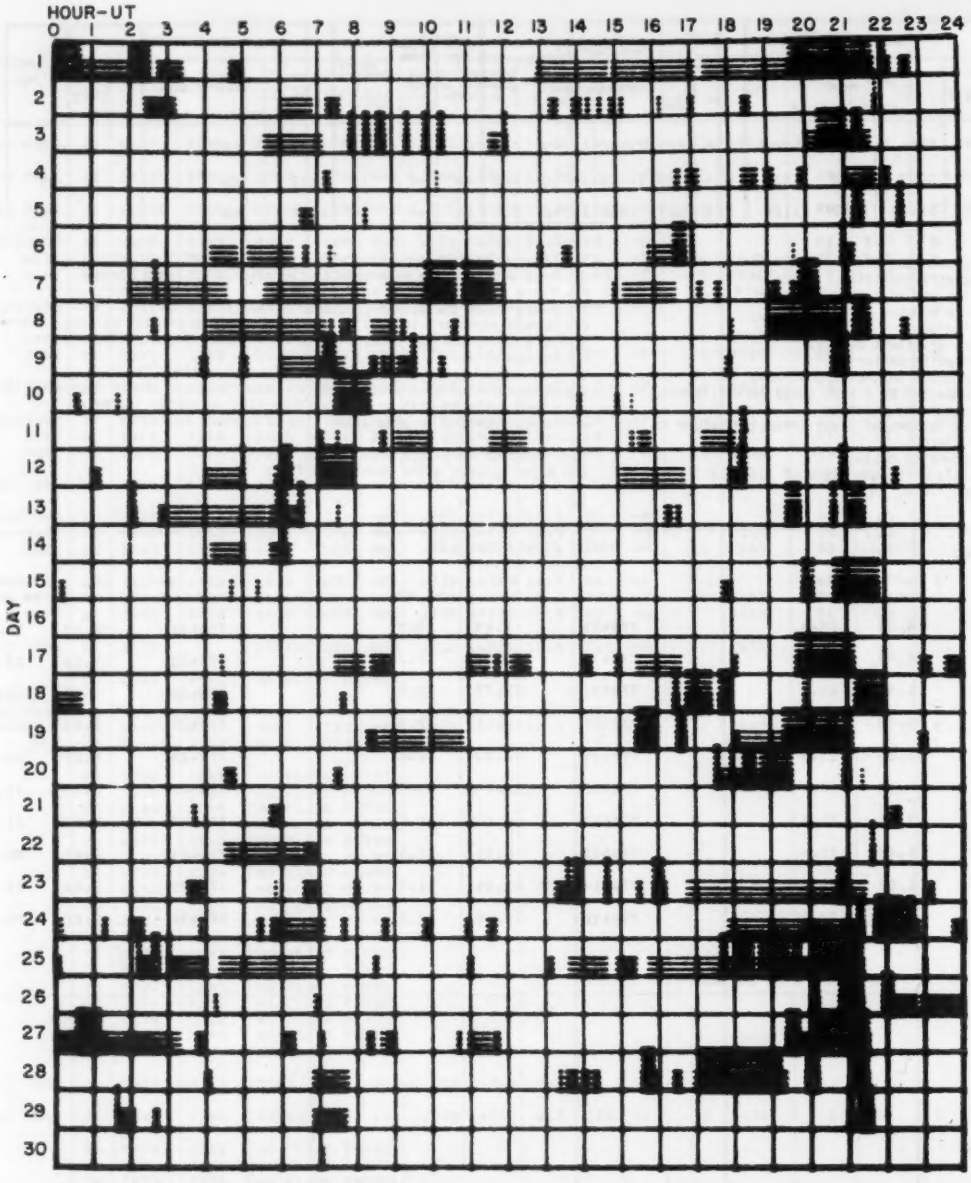
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
770401	0.00	20.4	770411	1.69	23.9	770421	28.18	24.0
770402	0.00	24.0	770412	14.36	22.3	770422	14.07	23.9
770403	1.95	21.8	770413	27.77	22.4	770423	1.07	23.8
770404	0.00	24.0	770414	13.41	23.9	770424	0.00	23.0
770405	3.83	23.5	770415	33.33	22.6	770425	0.00	20.6
770406	.85	23.4	770416	112.84	24.0	770426	1.73	22.9
770407	3.61	21.4	770417	49.86	22.5	770427	0.00	21.6
770408	0.00	21.6	770418	5.55	22.0	770428	0.00	20.7
770409	0.00	22.9	770419	62.01	21.3	770429	0.00	23.5
770410	0.00	23.0	770420	12.46	22.3	770430	5.07	24.0

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

APRIL 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kiev	McMath-Hulbert	Tashkent
Bucharest	Huancayo	Kodaikanal	Meudon	Tehran
Catania	Hurbanovo	Locarno	Mitaka	Upice
Culgoora	Istanboul	Lvov	Monte Mario	Voroshilov
Haute Provence	Kharkov	Manila	Palehua	Wendelstein
			Ramey	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

APRIL 1977

APR 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
2	9100	ARCE	20 GRF	1134.7	1259.1	234				
	2800	OTTA	24 R	1435	1450	15	0.8	0.4		
	2800	OTTA	27 RF	1435		180	0.8	0.7		
	2800	OTTA	24P R	1450		125	0.8			
	2800	OTTA	26 FAL	1655	1735	40	-0.8	-0.4		
	2800	OTTA	24O R	1910	1940	30	1	0.5		
	2800	OTTA	24P R	1940		300 D	1			
5	930	BORD	8 S	0737	0737.1	.1	11	1		
	29	UPIC	2 S/F	0854.2	0854.6	.5				
	33	UPIC	2 S/F	0854	0854.4	.8				
	29	UPIC	2 S/F	1010.5	1010.9	.7				
	33	UPIC	2 S/F	1010.5	1010.9	.9				
	930	BORD	8 S	1146.5	1146.5	.1	20	1		
	29	UPIC	2 S/F	1443.1	1443.4	.4				
	33	UPIC	2 S/F	1443.3	1443.4	.3				
	33	UPIC	45 C	1546.6	1548.1	2				
	29	UPIC	45 C	1547	1547.4	1.3				
6	29	UPIC	2 S/F	0735.2	0735.3	.3				
	33	UPIC	2 S/F	0735	0735.1	.3				
	2800	OTTA	20 GRF	1958	2005	37	0.8	0.4		
7	1000	TYKW	5 S	0030.6	0030.8	.4	3	1		
	2000	TYKW	5 S	0030.6	0030.7	.4	1.3	.4		OR
	2930	VORO	49 GB	0110		17	1500			
	2000	TYKW	5 S	0141.3	0141.9	1.3	1.5	.5		OR
	700	SYDN	45 C	0141.8	0142.2	2.2				
	1000	TYKW	45 C	0141	0142.1	2	7	1		
	500	HIRA	45 C	0142	0144.5	3.5	13	5		O
	700	SYDN	2 S	0144	0144.5	1				
	2800	OTTA	20 GRF	1500	1615	210	2	1		
8	33	UPIC	2 S/F	0843.4	0843.6	1.1				
	29	UPIC	2 S/F	0843.5	0843.8	1				
	33	UPIC	2 S/F	0853.9	0854.1	.5				
	29	UPIC	2 S/F	0854	0854.2	.5				
9	1420	ARCE	8 S	1007.5	1007.6	0.5				
11	3100	CRIM	26 FAL	0916	1222	186	7	2		
	3100	CRIM	1 S	1211	1212	2	3	1		
	2800	OTTA	1 S	1211.5	1212	1	1.2	0.6		
	2800	OTTA	21 GRF	1211	1215	11	0.8	0.4		
	3100	CRIM	24 R	1238	1330		4			
	2800	OTTA	24 R	1425	1515	50	1.4	0.7		
	2800	OTTA	27A RF	1425		335	1.4	1.2		
	4995	SGMR	20 GRF	1435.3	1440.9	12.9	4.1	1.2		
	1415	SGMR	20 GRF	1437.5	1442	10.7	2.7	.8		
	2695	SGMR	20 GRF	1437.6	1441.1	10.5	5	1.5		
	2800	OTTA	45 C	1437	1441	7	1.6	0.8		
	2800	OTTA	24P R	1515		175	1.4			
	2800	OTTA	26 FAL	1810	2000	110	1.4			
	2800	OTTA	21 GRF	2104	2140	110 D	3.8			
	2800	OTTA	1A S	2112	2115.5	9	1.8	0.9		
	2800	OTTA	1 S	2116	2117	2	3.6	1.8		
12	2950	GORK		0933.4	0951 U	24.2U	80			
	4995	MANI	46 C	0944.4	0950.8U	12.6U	450 U	117 U		SUNSET
	1415	MANI	4 S/F	0946	0950.9U	13.2U	119 U	26.8U		SUNSET
	1420	ARCE	46 C	0946.2	0950.5	9.2				
	1420	ARCE		0946.2	0950.5	5.2				
	1420	ARCE		0951.4	0951.9	4				
	1420	ARCE	30 PBI	0955.4		112				
	1470	BERL	46	0946.3	0951	45	98			
	9500	BERL	4	0946.3	0951.2	98	960			
	8800	MANI	46 C	0946.4	0953 U	10.6U	490 U	136 U		SUNSET
	2695	MANI	4 S/F	0946.8	0950.94	10.24	260 U	54 U		SUNSET
	9100	ARCE	4 S/F	0946.8	0951.5	9.5				
	950	GORK		0946.8	0951 U	17.9U	66			
	930	BORD	45 C	0946	0950	20	370	45		
	536	ONDR	46 C	0946	0953	34	60	16		
	536	ONDR		0946	0950.5		39			
	536	ONDR		0946	0959.2		35			
	650	GORK	21 GRF	0947.5	0955.8	19.3	5.3	3.5		
	808	ONDR	46 C	0947.6	0950	18	240	49		
	808	ONDR		0947.6	0951.3		150			
	808	ONDR		0947.6	0958.2		30			
	808	ONDR		0947.6	1000		30			
	9100	GORK	49 GB	0947.7	0952.2U	8.2	394			
	9100	GORK	29 PBI	0947.7	1056.7	59.9	26	11		
	650	GORK	45 C	0949.1	0950.8	6.7	108	32		
	650	GORK		0949.1	0953.4		71			
	606	MANI	46 C	0949.3	0950.8U	6.1U	65 U	18.4U		SUNSET

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

APRIL 1977

APR 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	33	UPIC	32	ABS	0949.6	0954.3	41.4				
	29	UPIC	32	ABS	0949.7	0954.5	31.5				
	1415	MANI	8	S	0950.7	0950.8	0.2	40.7U	12.6U		SUNSET
	113	POTS	45	C	0950	1026	110	14	3		
	408	TRST	47	GB	0951.3	0953.7	5	33			
	408	TRST	48	NS	0952.5	0952.8	.4	440			
	200	GORK			0955	1037.2	39	40			
	200	GORK	48	C	0955	1022.2	44	74			
	228	HARS	45	C	0955.3	1000	13	42	8		
	260	ONDR	46	C	0955.3	1000	28	49	14		
	260	ONDR			0955.3	1021		40			
	260	ONDR			0955.3	1022.2		40			
	510	POTS	45	C	0955	0958.5	10	8.4	1		
	9100	ARCE	29	FAL	0956.3		110				
	100	GORK	41	F	0956.6	0957 U	8.5	40			
	100	GORK			0956.6	1002		40			
	650	GORK	4	SF	0956.7	1000	7.9	17	5.2		
	1420	ARCE	46	C	0956.9	1058.4	5.1				
	1420	ARCE			0956.9	1058.4	2.7				
	1420	ARCE			0959.6	1000	2.4				
	408	TRST	49	GB	0957.2	1000.1	12.3	65			
	33	UPIC	46	C	0958.9	0959.5	2.7				
	29	UPIC	46	C	0959.5	1002.9	4.6				
	127	TORN	27	RF	1000 U	1032	105 U	6			
	127	TORN	28	PRE	1009.5	1012	3.5	4.8	3		
	228	HARS	28	PRE	1011.5	1019	8	10	4		
	100	GORK	41	F	1012.9	1016.5	11.7	40			
	100	GORK			1012.9	1021.2		550			
	127	TORN	45	C	1013	1015.6	5	44	13		
	408	TRST	41	F	1013	1021.8	30.8	30			
	127	TORN	45	C	1018	1021.5	5.5	240			
	113	POTS	45	C	1018	1021	6.5	250	60		
	228	HARS	45	C	1019.5	1022	7.5	60	20		
	3000	BERL			1021 E	1023.8D	24	4.9			
	260	ONDR	29	PBI	1023		67	7	2.3		
	127	TORN	7	C	1035	1037	3.6	14	7		
13	9100	GORK	20	GRF	0609.5	0612	12.9	6.4	3.2		
	33	UPIC	2	S/F	0647.6	0648.6	1.4				
	29	UPIC	2	S/F	0648.3	0648.6	.6				
	29	UPIC	46	C	0939.6	0942.5	3.1				
	33	UPIC	46	C	0939.8	0941.1	2.8				
	240	DWIN	45	C	1018	1018.2	.5	2	1		
	169	DWIN	45	C	1018	1018.2	.5	3	1		
	160	DWIN	45	C	1018	1018.2	.5	3	1		
	160	DWIN	45	C	1056.8	1057.5	1.4	3	1		
	240	DWIN	45	C	1056.8	1057.5	1.4	3	1		
	169	DWIN	45	C	1056.8	1057.5	1.4	3	1		
	2800	OTTA	1	S	1126.1	1127	1	2.6	1.3		
	1470	BERL	2		1126.2	1126.9	3.8	2.3			
	1420	ARCE	2	S/F	1126.3	1126.7	1.4				
	9500	BERL			1126.4	1126.8	1.1	5.7			
	3000	BERL	43		1126.8	1127.2	6.1	3.1			
	9100	ARCE	20	GRF	1126	1127.2	42				
	2800	OTTA	21	GRF	1126	1130	56	2.2	1.8		
	240	DWIN	45	C	1210	1211	2.2	1	1		
	169	DWIN	45	C	1210	1211	2.2	4	2		
	160	DWIN	45	C	1210	1211	2.2	4	2		
	9100	ARCE	24	R	1211.7		89				
	2800	OTTA	27	RF	1228		177	2.2	1.6		
	2800	OTTA	24	R	1228	1240	12	2.2	1.1		
	2800	OTTA	24P	R	1240		78	2.2			
	2800	OTTA	26	FAL	1358	1525	87	-2.2	-1.4		
	2800	OTTA	240	R	1548	1615	27	1.4	0.7		
	4995	SGMR	20	GRF	1717.9	1751.9	64.1U	8.8	5.3U		SWF
	8800	SGMR	20	GRF	1718.2	1756.6	63.8U	13.3	8 U		SWF
	2695	SGMR	20	GRF	1718.2	1742.6	63.8U	6.9	4.1U		SWF
	2800	OTTA	24	R	1718	1725	7	2.1	0.5		
	2800	OTTA	27AF	RF	1718		422	2.6			
	1415	SGMR	20	GRF	1721.4	1808.7	60.6U	2.4	1.4U		SWF
	2800	OTTA	24P	R	1725		383	2.1			
	2800	OTTA	1	S	1742	1742.5	1	1	0.5		
	2800	OTTA	32A	ABS	2130	2202	78	-4.2	-2.1		
	4995	BOUL	3	S	2203.5	2206	4.5	11	4		
	9400	HUAN	20	GRF	2203.8	2206.5	17	22.8	5.4		
	9400	TYKW	5	S	2205	2206.4	3	12	4		OR
	3758	TYKW	5	S	2205	2206.4	3	9	3		OR
	1000	TYKW	45	C	2205	2206.7	3	4	.8		
	1000	TYKW			2205	2206.1		3			
	2000	TYKW	45	C	2205	2206.6	6	7	2		07L
	2000	TYKW			2205	2206		7			10L
	2800	OTTA	4	S/F	2205	2206.5	6	10	2.6		
	1420	BOUL	4	SF	2205	2206.5	5	6	2		
	500	HIRA	5	S	2206	2206	.6	80	60		0
	2695	BOUL	3	S	2206.5	2207.5	4.5	9	3		

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APR 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	3750	TYKW	21 GRF	2208	2300	140	6	3		OR
	9400	TYKW	21 GRF	2208	2255	135	21	11		OR
	2000	TYKW	21 GRF	2211	2300	130	2	1		OL
	8800	MANI	45 C	2330.4	2336	7.6	39	12.2		
	3750	TYKW	21 GRF	2330	2340	35	6	3		OR
	9400	TYKW	21 GRF	2330	2344	35	23	12		OR
	4995	BOUL	45 C	2331.5	2335	5	28	9		
	9400	TYKW	5 S	2333	2333.3	2	30	10		OR
	3750	TYKW	5 S	2333	2333.9	2	5	2		OR
	3750	TYKW	5 S	2335	2336	2	4	1		OR
	9400	TYKW	5 S	2335	2336	2	35	12		05R
	1000	TYKW	45 C	2341	2343.5	4	15	1		
	2000	TYKW	5 S	2343	2343.5	1	.8	.3		OL
	2695	PENT	26 FAL	2348	2420	32	-2.6	-1.3		
14	2695	PENT	240 R	0030	0110	40	2.8	1.4		
	9400	TYKW	21 GRF	0535	0555	145 D	23	12 D		OR
	2000	TYKW	21 GRF	0535	0600	145 D	6	4.5D		OL
	3750	TYKW	21 GRF	0535	0555	145 D	12	6 D		OR
	1000	TYKW	21 GRF	0535	0615	100	3.7	1.6		
	606	MANI	40 F	0537.5	0548.7	21.5	25.5	9		
	3100	CRIM	2 S	0539	0543	6	26	9		
	3100	CRIM	30 PBI	0545	0545	89	10	3		
	1415	MANI	46 C	0540.9	0555.7	17.3	109	20.5		
	4995	MANI	3 S	0541	0543.1	5.2	21.1	8.1		
	2695	MANI	40 F	0541	0555.7	18.2	105	22.3		
	9400	TYKW	5 S	0542.5	0543.1	1.5	7	2		OR
	3750	TYKW	5 S	0542	0543	5	11	3		OR
	2000	TYKW	45 C	0542	0549.2	10	60	11		SL
	500	HIRA	45 C	0545.6	0548.6	3.3	13	3		SR
	3100	CRIM	2 S	0552	0556	6	14	5		
	2000	TYKW	45 C	0552	0555.7	6	50	7		SL
	1000	TYKW	45 C	0552	0553.3	6	2	.8		
	9100	GORK		0553.3E		79.9E				
	500	HIRA	45 C	0555.3	0556.3	2	9	3		SR
	1420	ARCE	1 S	0924	0924.1	0.4				
	5730	IRKU	28 PRE	1335	1342	7.5	9			WL
	5730	IRKU	21 GRF	1342.5	1343	1.5	23			WL
	5730	IRKU	29 PBI	1344	1354	60 D	17			WL
	930	BORD	3 S	1602	1602	.3	9	2		
	2695	SGMR	20 GRF	1604	1621	34.5	4.1	2.5		
	2800	OTTA	20 GRF	1615	1623	25	1.4	0.7		
	4995	SGMR	20 GRF	1619.5	1622.4	19	4.8	2.9		
	2800	OTTA	27A RF	1825		105	1.4	1.1		
	2800	OTTA	24 R	1825	1840	15	1.4	0.7		
	2800	OTTA	20 GRF	1829	1834	13	1.8	0.8		
	2800	OTTA	24P R	1840		60	1.4			
	2800	OTTA	26 FAL	1940	2010	30	-1.4	-0.7		
	1420	BOUL	1 S	2055	2055.5	2	3	1		
	1400	SYDN	45 C	2204.9	2206.1	5.3				
	700	SYDN	1 S	2206.2	2206.3	.2				
	4995	BOUL	1 S	2210.5	2211.5	5.5	11	4		
	9400	HUAN	1 S	2211	2211.5	1	22.2	9.8		
15	2000	TYKW	20 GRF	0152	0159	100	2.5	1		OL
	1000	TYKW	20 GRF	0152	0159	30	1.1	.5		
	160	DWIN	44 NS	0735 E		404		1		
	169	DWIN	44 NS	0735 E		404		1		
	9100	ARCE	20 GRF	0844.2	0857	155				
	1420	ARCE	20 GRF	0846.5	0857.4	210				
	3100	CRIM	3 S	0847	0857	45	8	3		
	2800	OTTA	20 GRF	1125	1150	85	2.6	1.3		
	2800	OTTA	20 GRF	1300	1320	60	1.4	0.7		
	2800	OTTA	24 R	1400	1520	80	2.4	1.2		
	2800	OTTA	27AFRF	1400		320	2.4	1.8		
	2800	OTTA	24P R	1520		157	2.4			
	2800	OTTA	1 S	1705	1705.8	6	0.8	0.4		
	2800	OTTA	20 GRF	1720	1745	32	0.8	0.6		
	2800	OTTA	26 FAL	1757	1920	83	-2.4	-1.2		
	245	SGMR	6 S	1919.6	1919.8	.5	11.1	3.3		5
16	260	ONDR	44 NS	0645 E	1209	503	10			
	127	TORN	44 NS	0900 E	1427.4	360 D	20			
	245	SGMR	43 NS	1131	1227.2	583	35.7			
	3100	CRIM	3 S	0658	0731	120	11	4		
	3100	CRIM	29 PBI	0658	0731	120	11	4		
	3750	TYKW	20 GRF	0700	0740	60 D	6	4 D		OR
	2000	TYKW	20 GRF	0700	0740	60 D	4.5	3 D		10L
	500	HIRA	45 C	0721	0731.7	21	15	5		WL
	650	GORK	4 SF	0723.6	0731.6	13.2	19			
	200	HIRA	45 C	0723	0731	18	45	5		WR
	536	ONDR	45 C	0723	0731.5	19	21	11		
	808	ONDR	45 C	0726	0731.5	10	15	7		
	228	HARS	45 C	0728.3	0729.6	9	50 D	12 D		
	260	ONDR	45 C	0729	0731.5	11	27	12		

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	2800	OTTA	23 GRF	1124	1145	86	2.4	1.6		
	2800	OTTA	1 S	1143.2	1144	1	0.8	0.4		
	237	TRST	41 F	1315	1315.5	1	33			R
	2800	OTTA	24 R	1324	1350	26	1.2	0.6		
	2800	OTTA	27 RF	1324		158	1.2	0.9		
	2800	OTTA	24P R	1350		75	1.2			
	237	TRST	41 F	1449	1449.8	1.1	20			R
	2800	OTTA	26 FAL	1505	1602	57	-1.2	-0.6		
	2800	OTTA	28 GRF	1610	1640	60	0.8	0.4		
	2800	OTTA	21 GRF	1720	1730	65	3	1.2		
	4995	SGMR	22 GRF	1725.1	1728.5	60 U	5.1	3.4U		
	2695	SGMR	22 GRF	1725.2	1729.6	60 U	11	6.6U		
	2695	BCUL	3 S	1726	1729.5	16	7	2		
	2800	OTTA	1 S	1727.5	1728.5	2.5	6.6	2.2		
	1420	BCUL	1 S	1727.5	1728.5	2	2	1		
	8800	SGMR	22 GRF	1727.7	1733.4	60 U	10.3	6.2U		
	1415	SGMR	22 GRF	1727.9	1825	60 U	2.5	1.5U		
	18	MCMA	6 S	1841	1842	3			1	
	2800	OTTA	21 GRF	2106	2114	80	9	4.3		
	2800	OTTA	46F C	2108	2111	5.8	15.4	6.2		
	4995	BCUL	1 S	2109.5	2110.5	3	14	5		
	4995	SGMR	28 GRF	2241.4	2312.5	40.6D	11.7U	7 U		
	2800	OTTA	1 S	2243	2244.5	2.5	1.2	0.6		
	2695	SGMR	22 GRF	2247.8	2316.4	34.2D	8.5U	5.1U		
	2695	PENT	21 GRF	2300		170 D	11.2			
	2695	PENT	21 GRF	2308	2329	55	5.2	2.6		
	1420	BCUL	45 C	2310.5	2313.5	9.5	34	11		
	2695	PENT	45 C	2310.8	2316.3	11	17.8	8.2		
	4995	BCUL	45 C	2310	2313.5	9	12	4		
	9400	TYKW	20 GRF	2310	2320	140	14	7		OR
	1000	TYKW	45 C	2310	2316.6	40	30	3		
	2000	TYKW	45 C	2310	2316.3	10	20	8		05L
	3750	TYKW	45 C	2310	2313.5	10	18	9		OR
	2000	TYKW	29 PBI	2320		160	5	2.5		
	4995	MANI	4 S/F	2311.2	2314.3	15.8	14.6	3.2		2 SPA
	2695	MANI	4 S/F	2311.2	2314.3	15.8	22.8	6		
	1415	MANI	4 S/F	2311.4	2314.8	17.4	79	16.9		
	2695	BCUL	45 C	2312.5	2317.5	10	17	6		
	1415	SGMR	4 S/F	2312.6	2313.6	9.4D	49.7	14.9U		
	606	MANI	4 S/F	2313.2	2315.7	15.3	29.5	8.8		
	606	SGMR	4 S/F	2316.6	2317.8	5.4D	13.9	8.3U		
	410	SGMR	6 S	2320.9	2322.5	1.1D	9.8	1 U		
	3750	TYKW	29 PBI	2320		160	5	3		
17	2800	TYKW	20 GRF	0215	0240	120	1.3	1		OL
	3750	TYKW	20 GRF	0220	0240	120	3.5	2		OR,116032F
	3100	CRIM	26 FAL	0526	1015	289	5	2		
	260	ONDR	46 C	0747	0747.5	5	7	3		
	29	UPIC	2 S/F	0748.3	0749.1	1.3				
	33	UPIC	2 S/F	0748.9	0749.1	.9				
	3100	CRIM	3 S	1040	1045	60	7			
	3100	CRIM	29 PBI	1040	1045	60	7			
	1470	BERL	6	1041.7	1044.8	6.5	3.2			
	1420	ARCE	21 GRF	1042.1		82				
	9180	ARCE	28 GRF	1042.5	1053	128				
	9180	ARCE	25 R	1042.5		200				
	260	ONDR	46 C	1042	1047.5	6	31	9		
	9500	BERL	6	1043	1053	27	7.8			
	1420	ARCE	2 SF	1044	1045	2.5				
	260	ONDR	8 S	1111	1111	.5	13			
	2800	OTTA	26A FAL	1205	1855	410	4	2		
	2800	OTTA	32 ABS	1215	1335	140	-4.4	-2.2		
	2800	OTTA	20 GRF	2100	2115	62	1	0.5		
	585	HIRA	45 C	2210.4	2210.4	2	65	25		HL
	2800	OTTA	1 S	2210.5	2211	1.5	1.4	0.9		
	2800	OTTA	21 GRF	2210	2220	22	1.4	0.7		
	2000	TYKW	5 S	2210	2211.5	6	1.3	.6		OL
	1000	TYKW	5 S	2210	2212	6	.8	.3		
18	2800	OTTA	20 GRF	1725	1758	125	1.8	0.9		
19	3100	CRIM	22 GRF	0718	0740	57	5	2		
	2000	TYKW	45 C	0720	0722.8	13	1.5	.6		OL
	3750	TYKW	20 GRF	0735	0742	35	4	2		OR
	9400	TYKW	20 GRF	0735	0742	40	4	2		OR
	2000	TYKW	20 GRF	0735	0742	35	1.7	1		
	3000	BERL	6	0735	0743	41	4.8			
	1470	BERL	6	0736	0740	29	1			
	9500	BERL	6	0737	0742.5	33	5.2			
	2800	OTTA	21 GRF	1457	1524	200	3.8	1.9		
	2800	OTTA	1 S	1509.1	1510.1	5	1.6	0.8		
	2800	OTTA	20 GRF	1940	1950	25	1.4	0.7		
20	9400	TYKW	20 GRF	0100	0130	90	4	2		OR
	2000	TYKW	20 GRF	0100	0120	80	1	.5		OL

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	3750	TYKW	20 GRF	0100	0130	90	2	1		OR,296024F
	260	ONDR	8 S	0825	0825.3	.5	16			
	260	ONDR	40 F	1034	1040.5	10	5	2		
	2800	OTTA	21 GRF	1625	1645	225	4	2.7		
	2800	OTTA	2 S/F	1638	1638.2	1	1.4	0.7		
	2800	OTTA	24 R	2050	2125	35	1.4	0.7		
	2800	OTTA	27 RF	2050		175	1.4	1.1		
	2800	OTTA	24P R	2125		105	1.4			
	2695	PENT	26 FAL	2310	2345	35	-1.4	-0.7		
21	33	UPIC	2 S/F	0647.7	0648	.7				
	29	UPIC	2 S/F	0648	0648.3	.6				
	3100	CRIM	22 GRF	0654	0705	33	4	1		
	3100	CRIM	25 R	0728	0730		4			
	3100	CRIM	20 GRF	0828	0850	48	3	1		
	3100	CRIM	20 GRF	0927	0939	84	2	1		
	234	POTS	45 C	1043.3	1043.7	.7	175	15		
	160	DWIN	45 C	1043.5	1044	.7	110	10		
	240	DWIN	45 C	1043.5		.7	300 D			
	169	DWIN	45 C	1043.5	1044	.7	190	10		
	237	TRST	41 F	1043.5	1043.8	.5	92			R
	408	TRST	8 S	1043.7	1043.7	.1	23			
	33	UPIC	2 S/F	1043.9	1044.1	.6				
	260	ONDR	8 S	1043	1043.5	1	74			
	29	UPIC	2 S/F	1044.2	1044.4	.3				
	3100	CRIM	24 R	1116	1124		2			
	1470	BERL	2	1348	1348.6	3	5.4			
	3000	BERL	4	1348.2	1348.7	1.8	8.8			
	2800	OTTA	2 S/F	1348.5	1348.9	3	7.8	2		
	1420	BOUL	8 S	1348.5	1348	1	5	2		
	240	DWIN	45 C	1350.6	1351	.7	60	5		
	2695	BOUL	45 C	1350	1351.5	1.5	8	3		
	260	ONDR	8 S	1351	1351.3	1	84			
	260	ONDR	45 C	1412	1414	3	12	3		
	2800	OTTA	24 R	1440	1505	25	0.8	0.4		
	2800	OTTA	27A RF	1440		198	0.8	0.6		
	2800	OTTA	24P R	1505		115	0.8			
	245	SGMR	6 S	1530.3	1537.4	9.8	47.3	14.2		3
	410	SGMR	6 S	1533.2	1536.8	5.5	54.8	16.4		3
	4995	SGMR	1 S	1534.5	1538.6	4.8	9	2.7		3
	2695	SGMR	1 S	1534.9	1538.7	4.5	5.3	1.6		3
	1420	ARCE	1 S	1537.2	1538.6	3.8				
	2800	OTTA	1 S	1537.5	1538.8	2	3.6	1.8		
	7000	SAOP	8 S	1537.6	1538.1	1.2	6.9	3.4		
	237	TRST	41 F	1537.8	1537.9	.6	63			R
	1415	SGMR	1 S	1537.8	1538.5	2.2	2.3	.7		3
	1420	BOUL	1 S	1537	1538.5	2.5	3	1		
	9100	ARCE	1 S	1538.2	1538.9	7.5				
	2695	BOUL	1 S	1539	1539.5	2	3	1		
	2800	OTTA	45 C	1628.7	1629	1	3.6	1.8		
	2800	OTTA	26 FAL	1700	1750	50	-0.8	-0.4		
	2800	OTTA	8 S	1830.7	1831.2	0.6	0.8			
	500	HIRA	45 C	2040.6	2041.7	2.5	500	150		0
	2800	OTTA	1 S	2040	2041.5	3	0.8	0.4		
	2800	OTTA	20 GRF	2102	2103	18	1	0.5		
	2800	OTTA	1 S	2116.8	2119	1	2	1		
	2695	PENT		2118.8	2119	1				
	2800	OTTA	20 GRF	2121	2138	70	1.4	0.7		
22	2695	MANI	3 S	0127.3	0128.5	4.3	28.6	11.4		
	4995	MANI	3 S	0127.4	0128.5	2.3	10.7	3.6		
	1415	MANI	2 S/F	0127.5	0128.5	1.5	6	1.7		
	2695	PENT	1 S	0127.8	0128.5	2	7	3.2		
	1480	SYDN	1 S	0128.4	0128.5	1.1				
	1000	TYKW	5 S	0128	0128.5	1	1.5	.5		
	2000	TYKW	5 S	0128	0128.5	2	3	1		OL
	3750	TYKW	5 S	0128	0128.7	2	7	2		296054F
	160	DWIN	45 C	0857.5	0857.7	.3	5	1		
	240	DWIN	45 C	0857.5	0857.7	.3	15	2		
	169	DWIN	45 C	0857.5	0857.7	.3	15	2		
	260	ONDR	8 S	0857	0857.3	1	13			
	240	DWIN	45 C	0938.4	0938.6	.5	8	2		
	169	DWIN	45 C	0938.4	0938.6	.5	4	2		
	160	DWIN	45 C	0938.4	0938.6	.5	9	2		
	260	ONDR	8 S	1029	1029.5	1	8			
	2800	OTTA	24 R	1135	1205	30	1.2	0.6		
	2800	OTTA	27A RF	1135		345	1.2	1.1		
	2800	OTTA	24P R	1205		295	1.2			
	260	ONDR	45 C	1206	1207.5	4	6	2		
	160	DWIN	45 C	1246.3	1248.5	2.5	20	2		
	240	DWIN	45 C	1246.3	1248.5	2.5	20	3		
	169	DWIN	45 C	1246.3	1248.5	2.5	25	2		
	260	ONDR	45 C	1246	1249	3	10	3		
	260	ONDR	45 C	1347	1349	3	9	2		
	2800	OTTA	20 GRF	1410	1420	30	1	0.7		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

APRIL 1977

APR 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	26 FAL	1700	1720	20	-1.2	-0.6		
	2800	OTTA	32 ABS	1730	1840	140	-1.4	-0.9		
23	3100	CRIM	26 FAL	0745	1130		5			
	260	ONDR	45 C	0754	0758	6	8	3		
	930	BORD	46 C	0816	0817.2	2	23	5		
	930	BORD	46 C	0833	0833.2	1	18	2		
	260	ONDR	45 C	1430	1432	2	20	10		
	1420	BOUL	1 S	2123.5	2124	1.5	2	1		
24	3100	CRIM	22 GRF	0653	0757	86	6	2		
	3100	CRIM	28 GRF	0833	0843	19	4	1		
	3100	CRIM	24 R	0855	0910		4			
25	930	BORD	8 S	0849.3	0849.3	.1	10	1		
	930	BORD	41 F	1448.9	1550.1	1.4	16	2		
	1420	BOUL	8 S	2153	2153.5	1.5	4	1		
27	3100	CRIM	20 GRF	0916	0924	64	3	1		
28	3100	CRIM	20 GRF	0646	0701	65	3	1		
	226	HARS	45 C	1205	1208	4	34	6		
29	700	SYDN	8 S	0808.5	0808.6	.2				
	930	BORD	46 C	1223.3	1223.8	1.4	13	2		
	930	BORD	46 C	1556.5	1557.6	1.2	42	3		
30	2800	OTTA	240 R	1320	1350	30	1	0.5		
	2800	OTTA	24P R	1350		540 D	1			
	2800	OTTA	20 GRF	1405	1455	145	1.4	0.7		

Reports received from the following observatories:

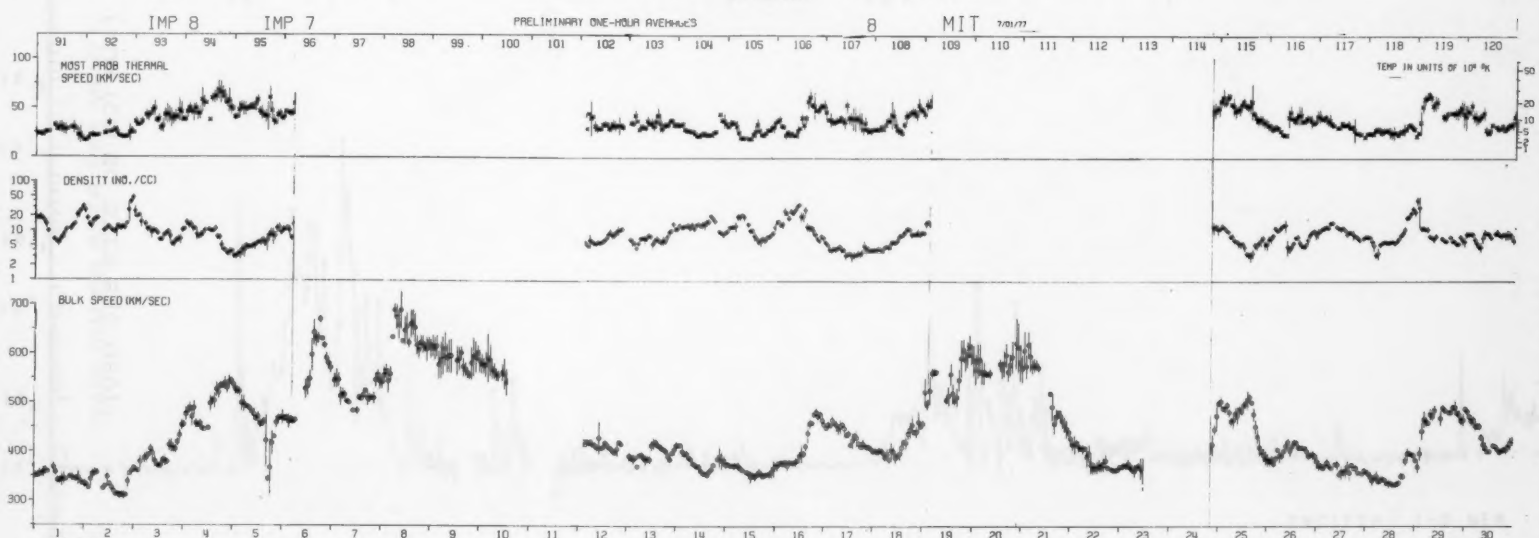
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

IMP 7 AND 8 SOLAR WIND PLASMA

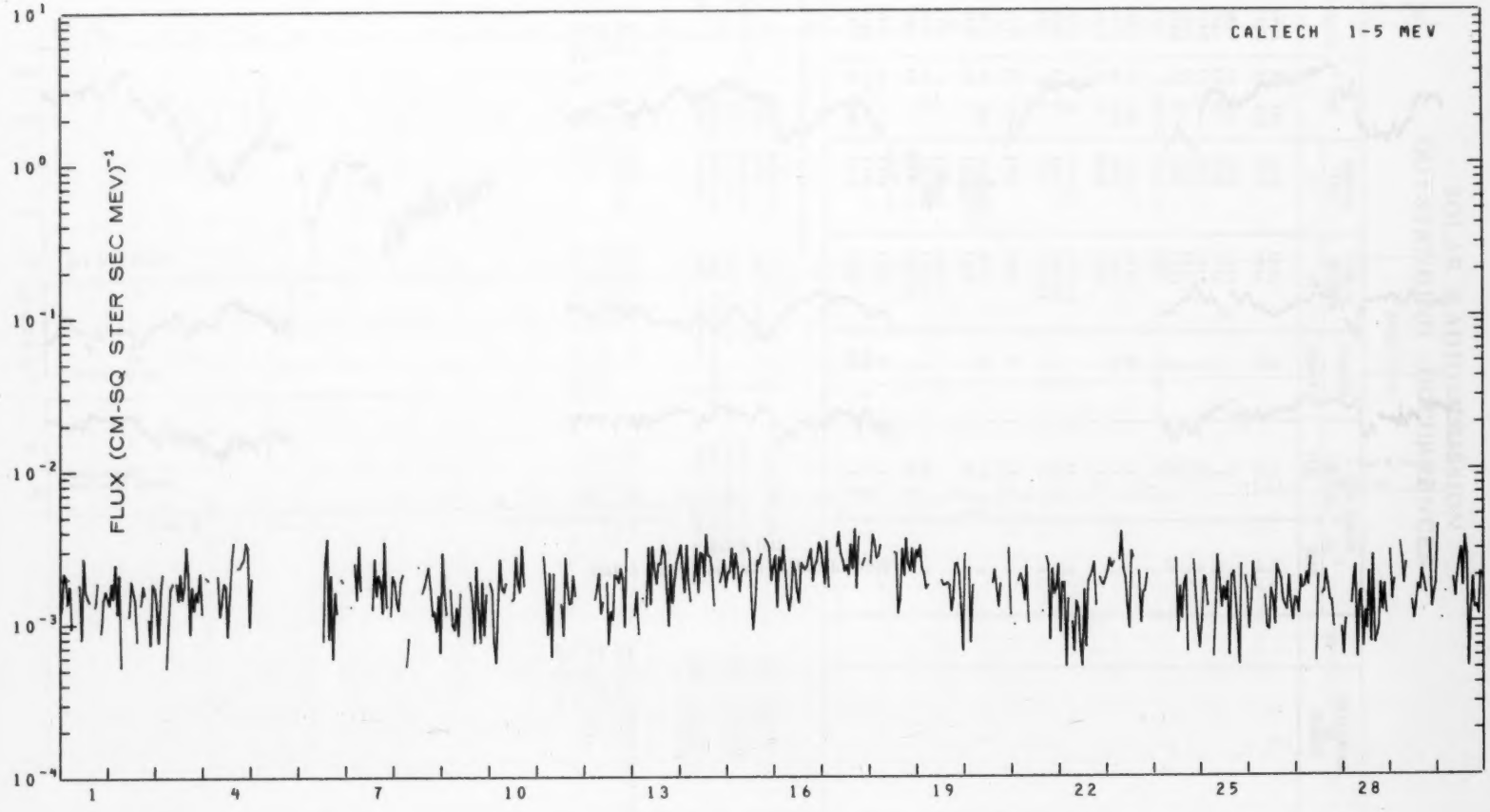
APRIL 1977



22
Apr 77

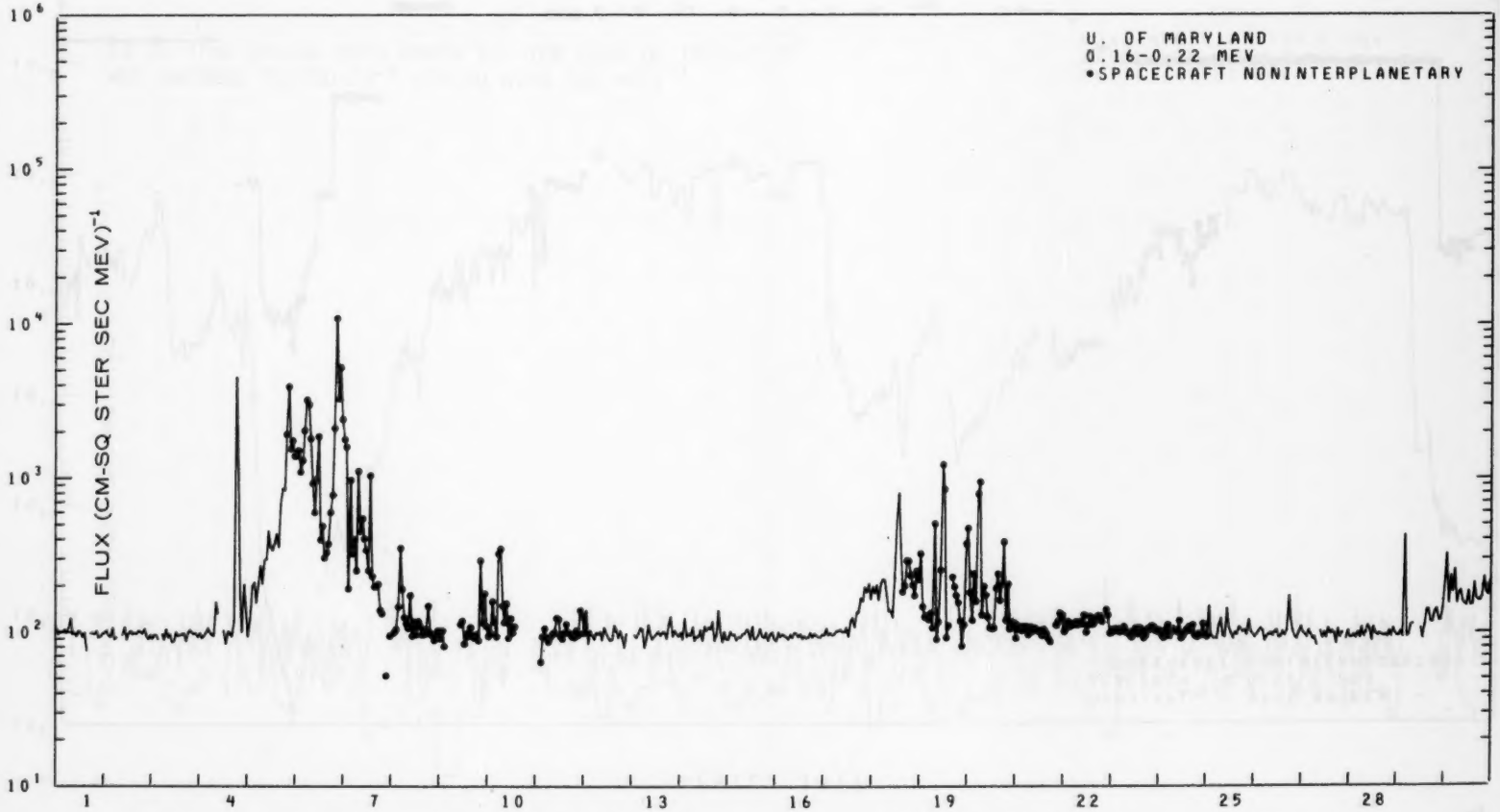
IMP 7 AND 8 ELECTRONS

APRIL, 1977



IMP 7 AND 8 LOW ENERGY PROTONS

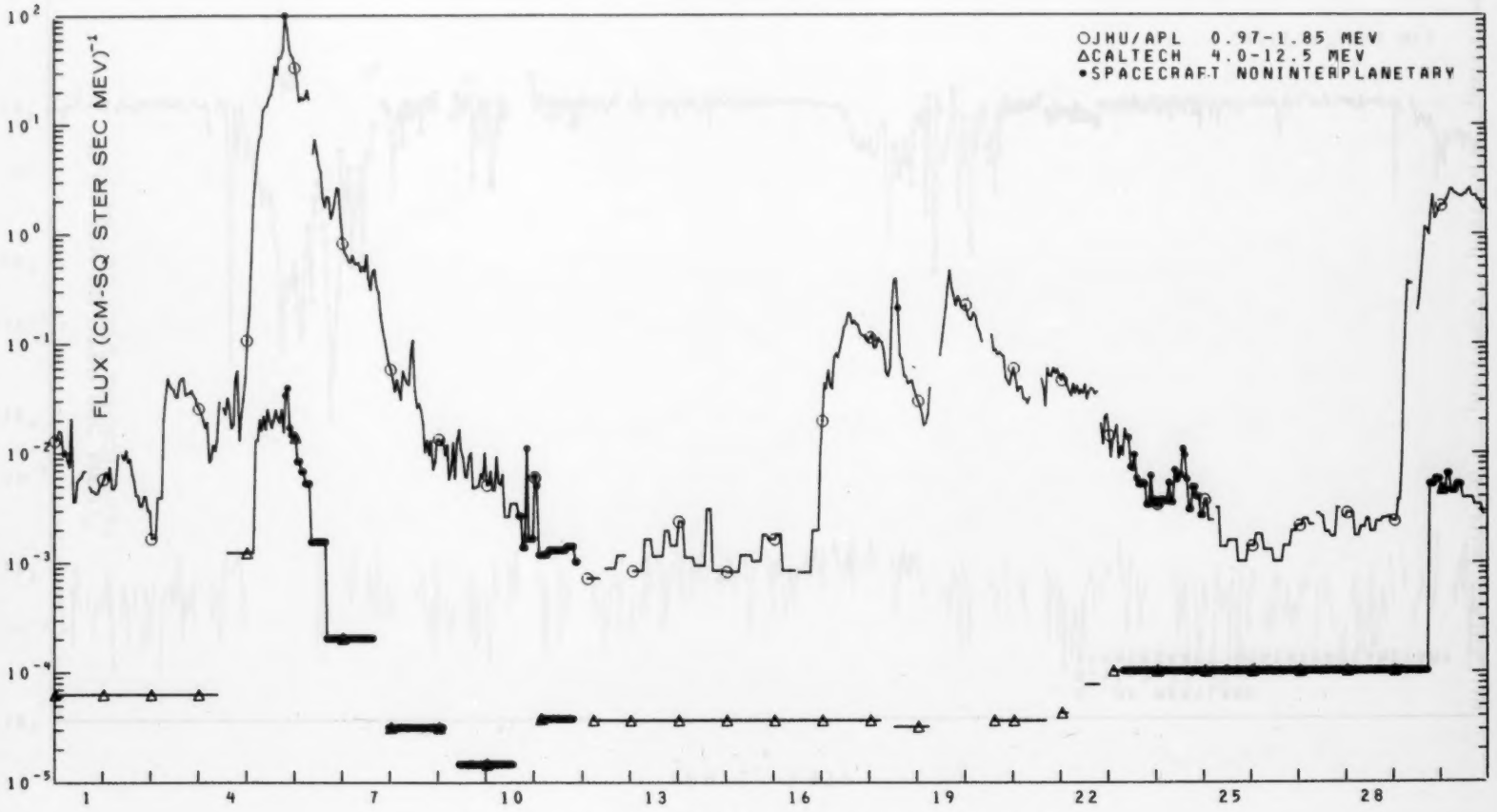
APRIL, 1977



23 Apr 77

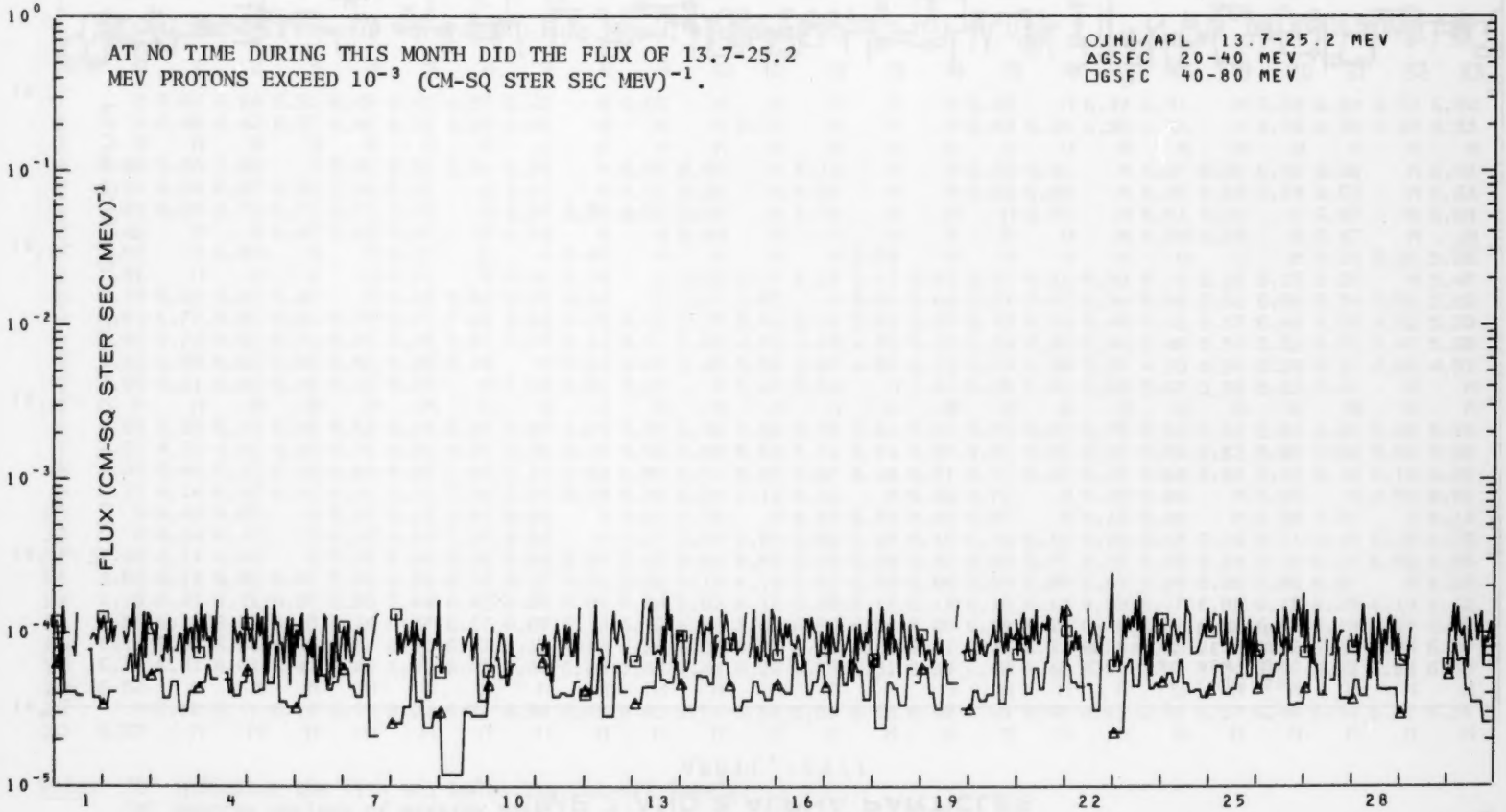
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

APRIL, 1977



IMP 7 AND 8 HIGH ENERGY PROTONS

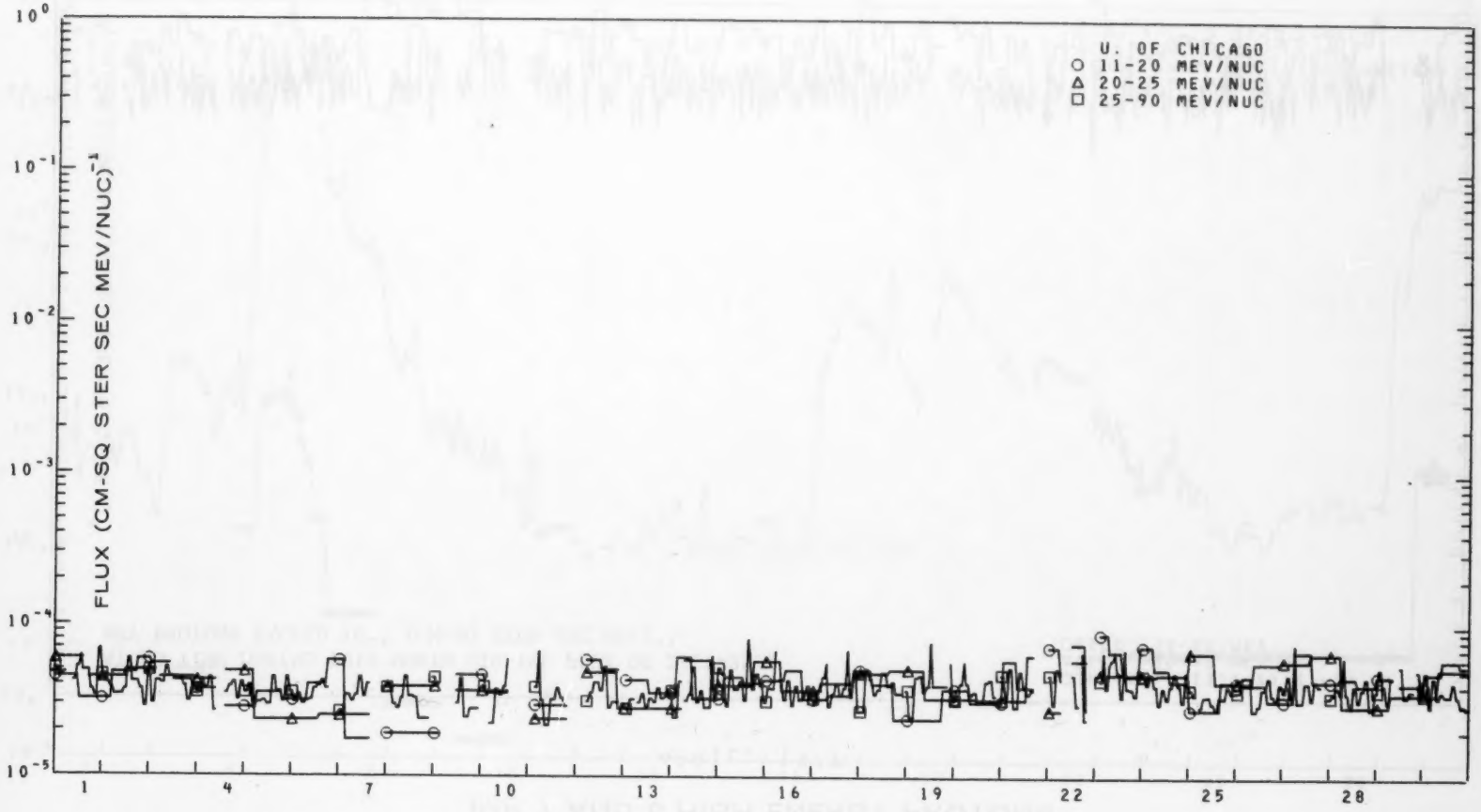
APRIL, 1977



25 Apr 77

IMP 7 AND 8 ALPHA PARTICLES

APRIL, 1977



COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
APRIL 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	6.66	6.54	6.51	6.49	6.47	6.55	6.49	M	6.66	M	M	M	M	M	6.39	M	6.37	6.51	M	6.55	6.54	6.52	6.54
2	M	6.46	6.42	6.33	6.45	6.35	6.35	5.88	M	M	M	6.33	M	M	M	6.02	6.35	6.25	6.33	M	6.38	6.38	6.33	6.32
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	6.06	5.90	5.36	M	5.66	5.88	5.94	6.00	M	6.06	6.09	M	6.12	M	M	6.35	6.41	M	6.37	6.47	6.48	6.46	M	6.52
5	6.35	6.28	6.57	6.50	6.54	6.52	M	5.97	M	6.55	6.26	M	6.36	M	M	6.56	6.68	M	6.55	6.66	6.74	6.63	M	6.64
6	6.65	6.55	6.79	6.71	6.72	6.32	M	6.29	6.53	6.52	6.76	M	6.70	M	M	M	6.71	M	6.61	6.54	M	6.47	M	6.64
7	6.46	M	M	6.67	6.06	5.86	M	6.34	M	M	6.44	M	M	M	M	M	M	M	6.74	6.54	M	6.47	M	M
8	6.52	M	6.52	M	M	6.77	M	M	6.40	M	M	M	M	6.88	M	M	M	M	M	M	M	5.55	5.29	5.23
9	5.31	M	M	M	M	6.31	M	6.37	6.50	M	6.40	6.17	6.23	6.17	6.09	6.17	6.21	6.33	6.16	6.26	6.15	6.07	M	5.47
10	6.15	5.63	5.65	5.88	M	5.30	5.52	5.63	5.94	M	5.97	5.82	M	5.66	5.64	5.71	5.82	5.94	5.90	5.82	6.00	5.74	5.82	5.82
11	5.91	5.77	5.84	5.54	5.73	5.71	5.82	5.84	5.72	5.75	5.73	5.81	5.60	5.61	5.67	5.13	5.24	5.40	5.43	5.57	5.60	5.58	4.82	5.20
12	5.35	5.74	5.82	5.70	5.91	5.75	5.81	5.85	5.74	5.71	5.62	4.62	4.89	4.95	5.12	5.24	5.28	5.36	5.40	5.50	5.52	5.55	5.62	5.60
13	5.58	5.59	5.68	5.65	5.54	5.59	5.38	M	5.54	5.62	5.49	5.50	5.07	4.97	5.13	5.54	5.30	5.37	4.75	4.96	5.22	5.31	4.85	4.91
14	4.95	5.21	5.09	5.19	5.36	5.37	M	5.00	5.06	5.29	M	5.47	5.54	M	5.61	5.60	5.63	5.62	5.67	5.38	5.63	5.41	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.65	5.53	5.63	5.76	5.62	5.80	5.79	5.27	4.75	5.09	5.49	5.58	5.36	5.61	5.57	5.73	5.81	5.79	5.54	5.68	5.63	4.42	5.06	5.39
17	4.31	4.39	4.65	4.59	4.76	4.91	4.95	5.38	5.45	5.58	5.68	5.63	5.31	5.74	5.87	5.91	5.92	5.97	5.95	6.02	5.99	5.82	5.88	5.80
18	6.04	6.06	6.12	6.14	6.00	6.06	6.00	6.11	6.03	6.07	6.11	6.08	6.07	6.18	6.21	6.17	6.16	6.20	5.64	6.09	6.19	6.18	6.18	6.09
19	6.11	6.14	6.16	6.12	6.16	6.11	6.10	6.09	5.39	5.28	6.00	6.12	6.16	M	6.26	4.77	M	5.39	5.84	M	5.59	M	6.05	6.02
20	M	5.43	5.62	M	5.99	6.13	6.01	5.90	M	5.67	5.75	M	5.96	5.95	5.97	5.97	M	5.13	5.45	M	5.88	5.87	M	6.13
21	M	6.14	6.17	M	6.12	6.04	5.99	6.03	M	5.27	5.99	5.87	5.96	6.30	6.15	6.10	6.13	6.05	6.12	6.10	6.11	6.15	6.10	6.18
22	6.22	6.11	6.09	M	5.92	6.00	5.58	5.55	5.68	5.67	5.84	6.05	5.90	5.50	5.32	5.64	5.77	5.96	6.30	6.24	6.18	6.20	6.08	6.03
23	6.02	6.13	5.98	6.07	5.93	6.09	6.14	6.17	6.06	6.02	6.15	6.10	6.05	6.10	6.06	5.99	6.09	6.03	6.07	5.89	5.95	6.01	M	6.24
24	6.18	6.11	6.12	5.92	5.90	5.94	6.06	6.08	5.96	6.00	6.02	6.15	6.20	6.17	6.13	6.19	6.14	5.99	6.17	6.06	6.19	6.20	6.14	6.12
25	6.06	6.19	6.17	6.15	6.16	6.07	6.17	6.07	6.14	6.12	6.16	6.01	6.06	6.04	6.09	6.09	6.13	6.16	6.27	6.20	6.21	6.18	6.18	6.12
26	6.11	6.08	6.06	6.06	6.07	6.11	6.12	6.16	6.15	6.24	6.24	6.27	6.30	6.32	6.31	6.37	6.32	6.28	6.36	6.32	6.32	6.28	6.25	6.30
27	6.36	6.41	6.41	6.41	6.41	6.39	6.49	6.42	6.45	6.48	6.44	6.56	6.55	6.51	6.39	6.48	6.48	6.51	6.57	6.54	6.56	6.52	6.62	6.59
28	6.52	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	6.08	6.11	6.14	6.16	6.24	6.27	6.36	6.42	6.45	6.56	6.52	6.58	6.53	6.45	6.46	6.42	6.43	6.43	6.37	6.40	6.44	6.42	6.35
30	6.33	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

27 Apr 77

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
APRIL 1977

Si XIV (6.18Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.70	7.42	B	7.12	7.27	7.13	7.57	7.00	M	B	M	M	M	M	M	7.14	M	7.07	7.46	M	7.31	7.20	B	7.60
2	M	7.16	6.95	6.68	7.49	6.77	7.10	5.85	M	M	M	6.79	M	M	M	6.40	6.78	7.29	6.79	M	7.03	6.77	7.03	6.95
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	6.14	5.95	5.25	M	5.82	6.09	6.14	6.30	M	6.76	6.78	M	6.89	M	M	6.80	B	M	6.95	7.42	6.89	7.21	M	7.29
5	B	6.61	7.25	M	7.33	7.36	M	7.08	M	7.75	6.55	M	M	M	M	7.55	7.11	M	7.15	7.27	7.04	7.10	M	M
6	7.35	7.53	7.00	7.05	7.33	7.53	M	6.94	7.05	M	7.21	M	7.10	M	M	M	7.37	M	7.32	7.59	M	7.52	M	6.96
7	6.40	M	M	6.15	6.10	5.74	M	6.57	M	M	7.18	M	M	M	M	M	M	M	6.78	M	M	6.96	M	M
8	6.75	M	6.88	M	M	7.08	M	M	6.95	M	M	M	M	7.22	M	M	M	M	M	M	M	M	5.83	6.16
9	6.25	M	M	M	M	6.52	M	7.10	6.66	M	6.55	6.53	6.42	6.27	6.36	6.57	6.60	6.90	6.50	6.50	6.25	6.09	M	5.40
10	5.59	5.59	5.89	6.13	M	5.28	5.65	5.73	6.33	M	6.28	6.03	M	5.91	5.71	5.96	5.97	6.22	6.06	6.09	6.30	5.88	6.10	6.22
11	6.02	5.91	6.19	5.67	6.05	6.01	6.27	6.46	5.95	6.13	6.02	6.04	5.68	5.74	5.69	4.97	5.16	5.44	5.64	5.82	5.89	5.84	4.76	5.30
12	5.66	6.35	6.36	5.80	6.21	5.85	6.20	6.29	5.90	5.97	5.67	4.50	4.75	4.80	5.08	5.24	5.29	5.42	5.50	5.70	5.65	5.75	5.78	5.75
13	5.76	5.84	5.98	5.88	5.65	5.85	5.34	M	5.65	5.78	5.53	5.55	5.06	4.94	5.13	5.65	5.17	5.39	4.67	4.95	5.32	5.44	4.77	4.94
14	4.98	5.22	5.03	5.25	5.46	5.56	M	4.94	5.07	5.46	M	5.57	5.76	M	5.89	5.86	5.88	5.89	5.83	5.37	5.80	5.34	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.98	5.64	5.64	6.12	5.84	6.19	6.11	4.87	4.44	5.00	5.64	5.80	5.33	5.82	5.71	6.16	6.13	6.14	5.73	5.97	5.76	4.20	4.91	5.24
17	4.16	4.25	4.52	4.43	4.82	4.93	5.03	5.76	5.75	5.97	6.07	5.73	5.69	6.39	6.46	6.36	6.28	6.29	6.34	6.45	6.43	5.88	6.47	6.19
18	6.72	6.54	6.55	6.45	6.34	6.53	B	6.48	6.24	6.55	6.82	6.64	6.52	6.77	6.77	6.62	6.70	6.58	5.66	6.62	6.82	6.74	6.52	6.36
19	6.51	6.53	6.61	6.65	6.71	6.45	6.47	6.71	5.21	5.14	6.56	6.67	6.42	M	6.61	4.46	M	5.42	6.24	M	5.59	M	6.42	6.20
20	M	5.31	5.85	M	6.37	6.32	6.20	6.11	M	5.82	5.79	M	6.22	6.30	6.27	6.34	M	4.80	5.64	M	6.12	6.17	M	6.58
21	M	6.65	6.62	M	6.67	6.34	6.59	6.32	M	5.05	6.39	5.88	6.21	7.59	6.56	6.44	6.88	6.50	6.83	6.65	6.71	6.64	6.63	7.01
22	7.59	6.46	6.41	M	6.25	6.44	5.46	5.54	5.92	5.88	6.14	6.48	6.13	5.44	5.22	5.84	5.88	6.47	7.02	6.49	6.50	6.70	6.39	6.25
23	6.44	6.46	6.08	6.47	5.78	6.59	6.69	6.86	6.61	6.61	6.67	6.56	6.27	6.60	6.39	6.28	6.56	6.48	6.46	6.11	6.45	6.97	M	AP
24	6.79	6.60	6.63	6.14	6.11	6.38	6.63	6.51	6.39	6.45	6.43	6.63	6.82	6.55	6.59	6.60	6.59	6.55	6.99	6.60	6.68	7.04	6.64	6.39
25	6.39	6.71	6.82	6.98	6.75	6.43	6.66	6.46	6.56	6.56	6.89	6.22	6.57	6.38	6.54	6.97	6.65	6.77	6.76	6.83	6.69	6.67	6.58	6.27
26	6.54	6.60	6.56	6.42	6.53	6.38	6.57	6.57	6.56	7.12	6.76	7.16	6.90	6.90	6.90	7.07	7.54	7.05	6.90	7.66	6.95	6.97	6.79	7.04
27	7.04	7.08	7.70	7.22	7.11	7.09	B	7.24	7.11	7.22	6.98	B	7.38	7.15	7.62	7.05	7.17	B	7.33	7.42	7.27	B	7.33	7.56
28	7.15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	6.38	6.42	6.54	6.58	6.71	6.87	6.82	6.98	7.18	7.47	7.36	7.04	7.08	6.88	7.01	7.06	7.28	6.95	7.05	7.05	7.17	6.88	6.97
30	6.79	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
APRIL 1977

Si XIII (6.64Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	1.70	7.06	6.79	6.76	6.76	6.89	6.92	6.76	M	6.97	M	M	M	M	M	6.69	M	6.62	6.78	M	6.89	6.77	6.77	6.91
2	M	6.70	6.62	6.29	6.72	6.64	6.54	5.55	M	M	M	6.35	M	M	M	6.00	6.49	6.58	6.48	M	6.45	6.43	6.46	6.48
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	5.71	5.54	4.86	M	5.41	5.71	5.73	5.90	M	6.08	6.18	M	6.32	M	M	6.53	6.68	M	6.61	6.80	6.90	6.83	M	6.84
5	6.40	6.27	6.83	6.68	6.78	6.84	M	7.03	M	6.69	6.12	M	6.30	M	M	6.89	7.00	M	7.01	6.87	6.76	6.75	M	6.98
6	6.89	6.89	7.05	6.99	6.95	6.68	M	6.37	6.78	6.90	7.21	M	6.44	M	M	M	6.96	M	7.03	7.34	M	6.61	M	6.80
7	6.02	M	M	5.63	5.77	5.26	M	6.06	M	M	6.42	M	M	M	M	M	M	M	6.43	6.67	M	6.36	M	M
8	6.71	M	6.58	M	M	6.78	M	M	7.00	M	M	M	M	7.00	M	M	M	M	M	M	M	6.57	6.33	6.43
9	6.63	M	M	M	M	6.32	M	6.55	6.88	M	6.22	6.10	6.12	6.01	6.11	6.08	6.04	6.25	6.19	6.17	6.00	5.76	M	5.08
10	5.24	5.26	5.40	5.74	M	4.89	5.22	5.39	5.90	M	5.86	5.55	M	5.44	5.33	5.55	5.57	5.76	5.58	5.66	5.86	5.45	5.71	5.73
11	5.74	5.52	5.76	5.29	5.69	5.59	5.78	5.89	5.53	5.70	5.55	5.71	5.31	5.27	5.31	4.61	4.76	5.06	5.21	5.42	5.45	5.41	4.31	4.86
12	5.18	5.76	5.91	5.44	5.86	5.45	5.73	5.77	5.59	5.65	5.34	4.13	4.32	4.40	4.70	4.88	4.94	5.09	5.18	5.34	5.33	5.41	5.51	5.40
13	5.47	5.50	5.62	5.56	5.16	5.51	4.98	M	5.36	5.49	5.22	5.26	4.71	4.59	4.82	5.28	4.83	5.03	4.32	4.61	4.94	5.10	4.38	4.55
14	4.59	4.86	4.64	4.85	5.02	5.14	M	4.65	4.74	5.13	M	5.29	5.47	M	5.54	5.48	5.54	5.53	5.52	5.01	5.47	5.04	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.50	5.33	5.29	5.66	5.49	5.81	5.76	4.60	4.08	4.69	5.36	5.49	5.03	5.54	5.43	5.73	5.81	5.81	5.36	5.66	5.42	3.87	4.57	4.90
17	3.75	3.87	4.18	4.09	4.44	4.55	4.64	5.33	5.37	5.57	5.72	5.43	5.22	5.81	5.99	6.02	5.95	6.04	6.06	6.13	6.02	5.55	5.90	5.73
18	6.15	6.26	6.25	6.07	6.02	6.15	6.22	6.20	6.03	6.08	6.32	6.29	6.17	6.33	6.33	6.30	6.34	6.32	5.32	6.19	6.43	6.24	6.14	5.98
19	6.06	6.14	6.23	6.28	6.31	6.01	6.17	6.13	4.93	4.79	6.10	6.38	6.12	M	6.26	4.10	M	5.05	5.00	M	5.20	M	6.18	5.77
20	M	4.90	5.46	M	6.10	5.97	5.85	5.79	M	5.47	5.46	M	5.88	5.88	5.84	5.85	M	4.44	5.22	M	5.77	5.77	M	6.25
21	M	6.25	6.24	M	6.22	5.93	6.00	5.85	M	4.68	6.01	5.51	5.77	6.45	6.07	6.03	6.21	5.92	6.24	6.13	6.21	6.05	6.05	6.24
22	6.33	6.06	6.03	M	5.77	5.97	5.03	5.10	5.40	5.39	5.67	6.00	5.71	5.05	4.81	5.41	5.49	6.02	6.43	6.13	6.11	6.21	6.01	5.90
23	6.03	6.05	5.65	6.02	5.47	6.16	6.30	6.33	6.17	6.23	6.26	6.17	5.98	6.23	6.11	5.98	6.18	6.09	6.13	5.78	6.07	6.09	M	6.36
24	6.33	6.21	6.25	5.79	5.73	5.93	6.12	6.18	6.04	6.09	6.06	6.30	6.35	6.17	6.14	6.16	6.25	6.36	6.37	6.23	6.35	6.33	6.30	6.08
25	6.10	6.35	6.36	6.23	6.31	6.11	6.26	6.18	6.21	6.23	6.32	5.85	6.21	6.08	6.12	6.20	6.20	6.23	6.39	6.37	6.32	6.31	6.27	5.95
26	6.19	6.22	6.18	6.13	6.07	6.01	6.21	6.25	6.26	6.50	6.36	6.47	6.54	6.51	6.49	6.59	6.57	6.47	6.52	6.52	6.45	6.46	6.35	6.49
27	6.65	6.70	6.84	6.65	6.66	6.69	6.73	6.74	6.71	6.84	6.76	6.84	6.92	6.84	6.52	6.76	6.74	6.75	6.86	6.83	6.79	7.05	6.96	6.95
28	6.90	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	5.92	5.98	5.98	6.05	6.19	6.28	6.44	6.53	6.64	6.79	6.71	6.74	6.62	6.57	6.70	6.66	6.59	6.60	6.63	6.70	6.70	6.60	6.61
30	6.52	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

MARCH 1977 DATA

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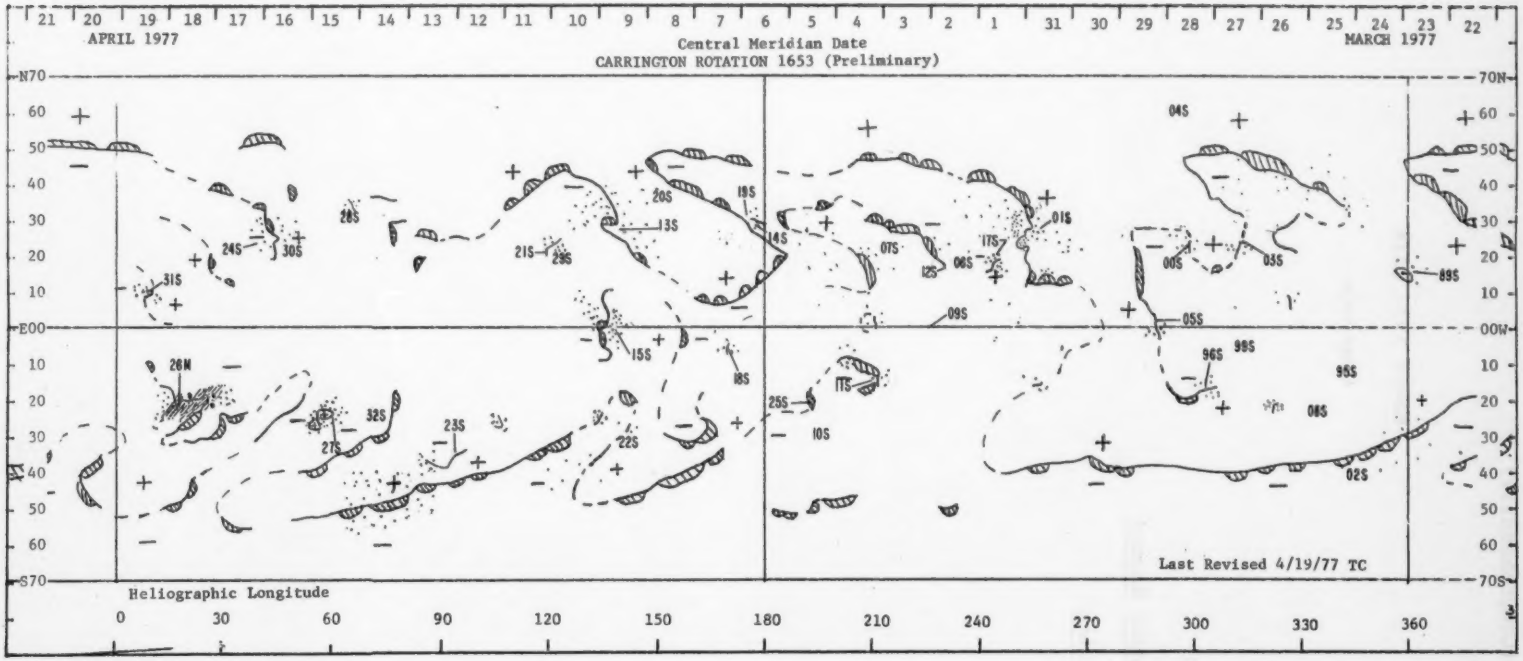
ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

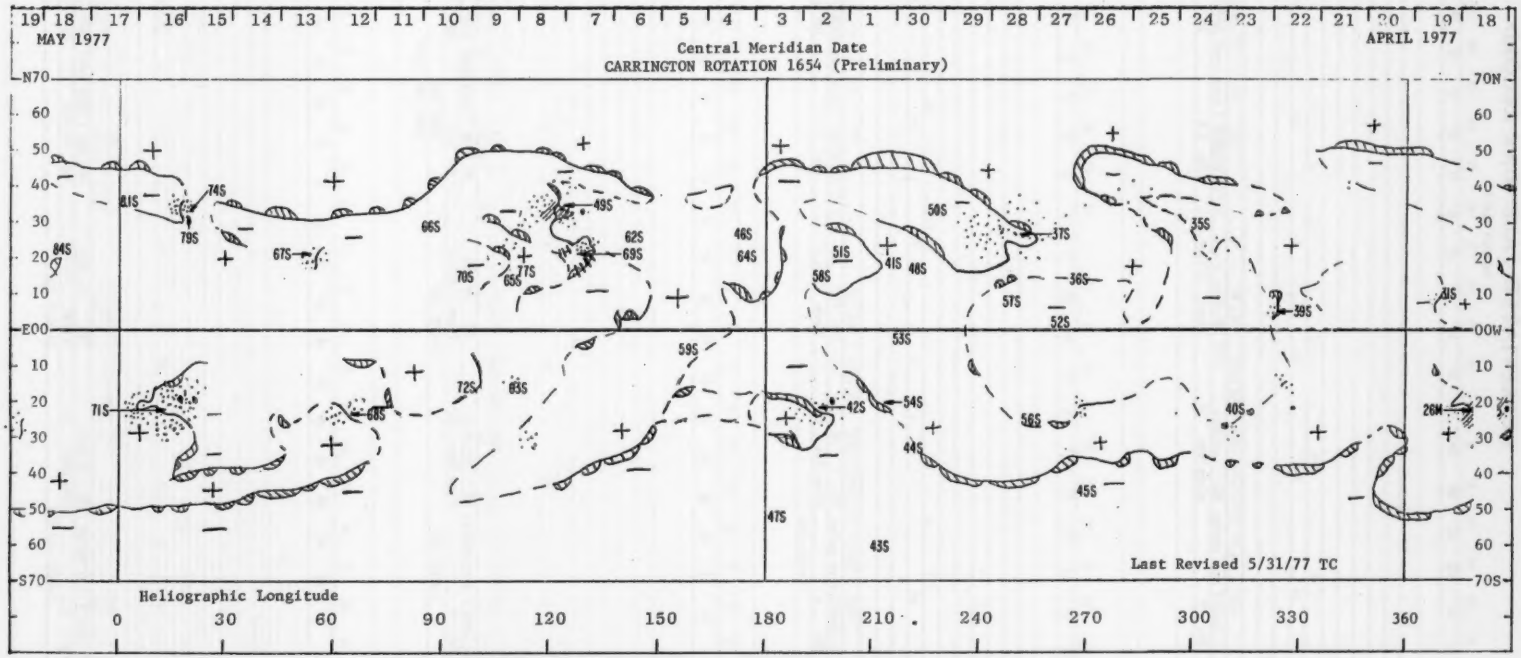
MARCH - APRIL 1977



ABBREVIATED CALENDAR RECORD

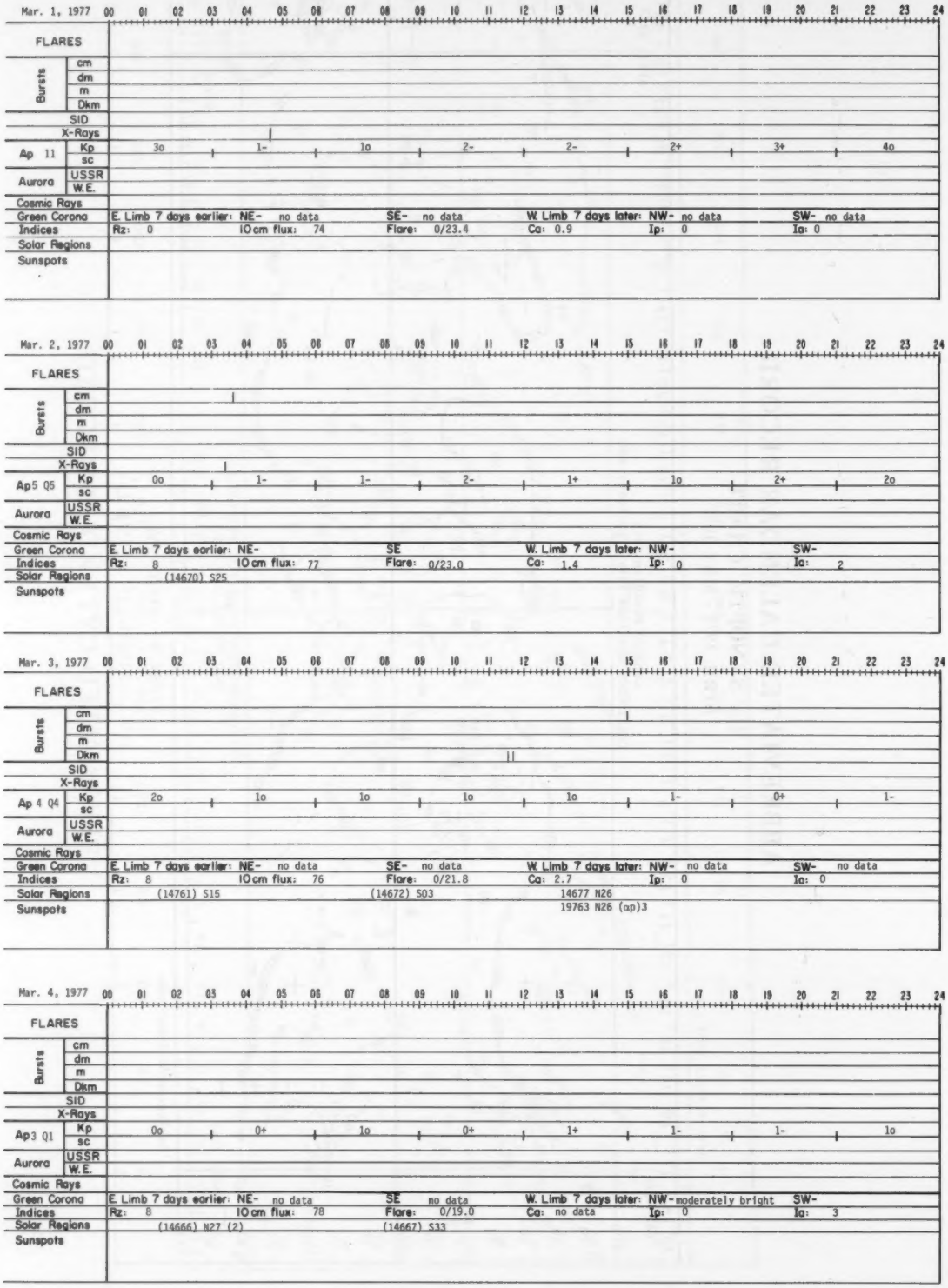
Hα SYNOPTIC CHART

APRIL 1977 - MAY 1977



ABBREVIATED CALENDAR RECORD

MARCH 1977



Mar. 5, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm | dm | m | Dkm

SID

X-Rays

Ap 4 Q2 — Kp: 1- | 2- | 1o | 1- | 1+ | 0+ | 1o | 0+ ; sc

Aurora — USSR | W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- moderately bright SW-

Indices — Rz: 8 10 cm flux: 79 Flare: 0/24.0 Ca: no data Ip: 0 Ia: 1

Solar Regions — (14676) S11

Sunspots

Mar. 6, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm | dm | m | Dkm

SID

X-Rays

Ap 6 — Kp: 0+ | 1- | 1o | 1o | 3- | 2+ | 2+ | 2o ; sc

Aurora — USSR | W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright SE W. Limb 7 days later: NW- moderately bright SW-

Indices — Rz: 9 10 cm flux: 79 Flare: 0/20.0 Ca: no data Ip: 0 Ia: 3

Solar Regions

Sunspots

Mar. 7, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm | dm | m | Dkm

SID

X-Rays

Ap 5 Q7 — Kp: 2+ | 2- | 2o | 1o | 1o | 1+ | 1- | 1o ; sc

Aurora — USSR | W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright SE- W. Limb 7 days later: NW- moderately bright SW-

Indices — Rz: 8 10 cm flux: 78 Flare: 0/22.3 Ca: 8.7 Ip: 0 Ia: 0

Solar Regions

Sunspots

Mar. 8, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm | dm | m (ns) | Dkm

SID

X-Rays

Ap 12 — Kp: 2- | 1+ | 1o | 1o | 2- | 3o | 3o | 5- ; sc

Aurora — USSR: ϕ = 57° 2000-2100 (R_1A1-2) | W.E.

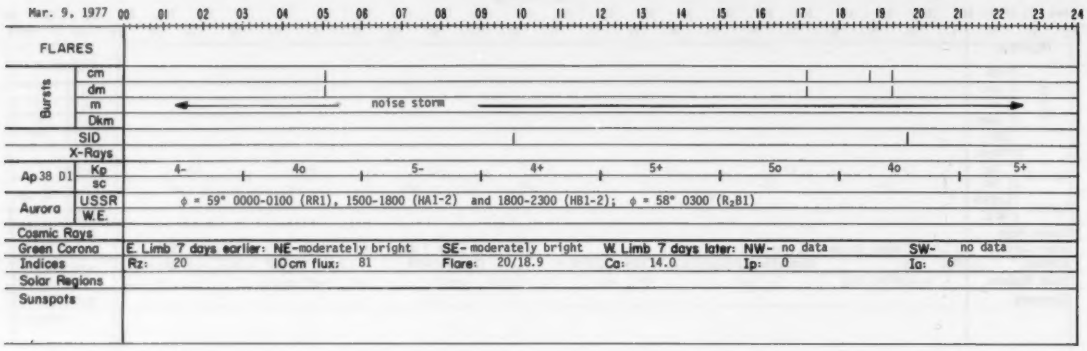
Cosmic Rays

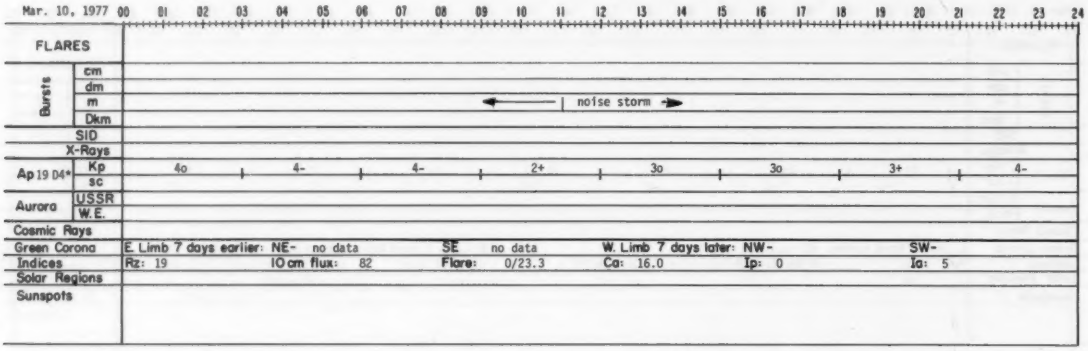
Green Corona — E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-

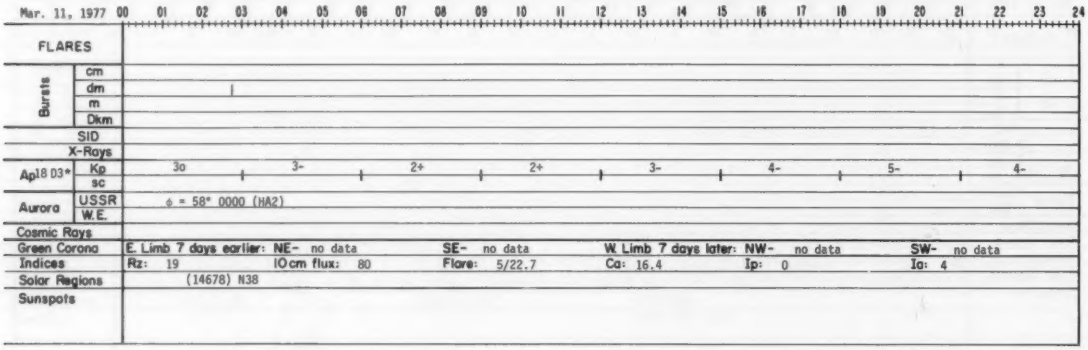
Indices — Rz: 20 10 cm flux: 83 Flare: 15/20.6 Ca: 12.5 Ip: 3 Ia: 1

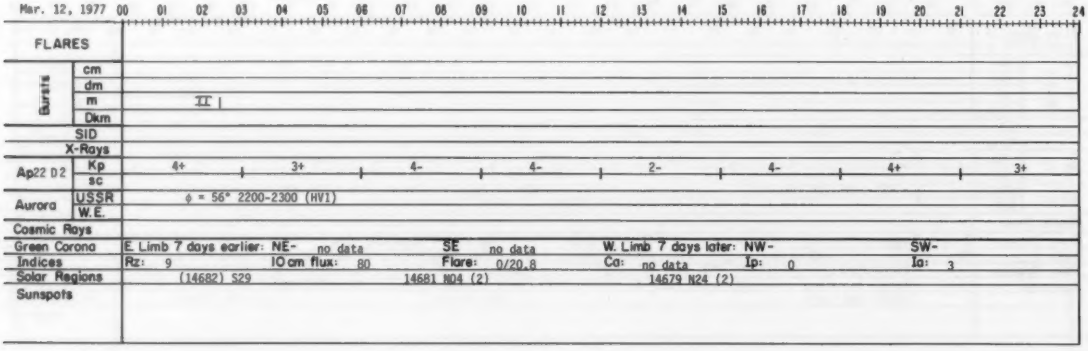
Solar Regions — 14674 N19 (2)

Sunspots — 19762 N17 (af)4
(19764) N22 (af)3


Mar. 9, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 38 D1
Kp
sc
4- 4o 5- 4+ 5+ 5o 4o 5+
Aurora
USSR
W.E.
ϕ = 59° 0000-0100 (RR1), 1500-1800 (HA1-2) and 1800-2300 (HB1-2); ϕ = 58° 0300 (R2B1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE-moderately bright SE- moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 20 10cm flux: 81 Flare: 20/18.9 Ca: 14.0 Ip: 0 Ia: 6
Solar Regions
Sunspots


Mar. 10, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 19 D4*
Kp
sc
4o 4- 4- 2+ 3o 3o 3+ 4-
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices
Rz: 19 10cm flux: 82 Flare: 0/23.3 Ca: 16.0 Ip: 0 Ia: 5
Solar Regions
Sunspots


Mar. 11, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap18 D3*
Kp
sc
3o 3- 2+ 2+ 3- 4- 5- 4-
Aurora
USSR
W.E.
ϕ = 58° 0000 (HA2)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 19 10cm flux: 80 Flare: 5/22.7 Ca: 16.4 Ip: 0 Ia: 4
Solar Regions
(14678) N38
Sunspots


Mar. 12, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
II
SID
X-Rays
Ap22 D2
Kp
sc
4+ 3+ 4- 4- 2- 4- 4+ 3+
Aurora
USSR
W.E.
ϕ = 56° 2200-2300 (HV1)
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices
Rz: 9 10cm flux: 80 Flare: 0/20.8 Ca: no data Ip: 0 Ia: 3
Solar Regions
(14682) S29 14681 N04 (2) 14679 N24 (2)
Sunspots

Mar. 13, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm; dm; m; Dkm

SID

X-Rays

Ap 13 — Kp: 4+ | 3- | 2o | 2- | 2- | 2+ | 2+ | 4-

Ap 13 — sc

Aurora — USSR: ϕ = 58° 0000 (HA2) and 2300-2400 (R_1B2)

Aurora — W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE-moderately bright; SE- moderately bright; W. Limb 7 days later: NW-; SW-moderately bright

Indices: Rz: 8; 10cm flux: 79; Flare: 0/19.7; Ca: 11.5; Ip: 0; Ia: 2

Solar Regions

Sunspots

Mar. 14, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm; dm; m; Dkm

SID

X-Rays

Ap 12 — Kp: 4+ | 4+ | 3- | 1o | 1o | 1+ | 1o | 1+

Ap 12 — sc

Aurora — USSR: ϕ = 59° 0000-0100 (HA1) and ϕ = 57° 0300 (R_2R1)

Aurora — W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE-moderately bright; SE moderately bright; W. Limb 7 days later: NW-; SW- moderately bright

Indices: Rz: 7; 10cm flux: 78; Flare: 2/23.7; Ca: no data; Ip: 0; Ia: 2

Solar Regions: 14680 S43 (2)

Sunspots

Mar. 15, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm; dm; m; Dkm

SID

X-Rays

Ap 5 Q6 — Kp: 2- | 1- | 2+ | 2o | 2- | 1+ | 0+ | 0o

Ap 5 Q6 — sc

Aurora — USSR

Aurora — W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE- no data; SE- no data; W. Limb 7 days later: NW-; SW-moderately bright

Indices: Rz: 0; 10cm flux: 76; Flare: 0/24.0; Ca: 8.1; Ip: 0; Ia: 1

Solar Regions: (14683) S10; (14684) S32

Sunspots

Mar. 16, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm; dm; m; Dkm

SID

X-Rays

Ap6 Q10 — Kp: 2- | 2+ | 2- | 1o | 1- | 1o | 2+ | 2+

Ap6 Q10 — sc

Aurora — USSR

Aurora — W.E.

Cosmic Rays

Green Corona: E. Limb 7 days earlier: NE-; SE-; W. Limb 7 days later: NW-; SW-

Indices: Rz: 0; 10cm flux: 75; Flare: 0/23.6; Ca: 6.6; Ip: 0; Ia: 0

Solar Regions: (14687) S19

Sunspots

Mar. 17, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	I
SID		
X-Rays		
Ap 9	Kp	3- 2+ 1o 2o 2o 3o 3o 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices		Rz: 0 10cm flux: 75 Flare: 0/21.5 Ca: 4.6 Ip: 0 Ia: 0
Solar Regions		
Sunspots		

Mar. 18, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 11	Kp	4- 4- 2o 2o 3- 2- 2- 1+
	sc	
Aurora	USSR	ϕ = 59° 1800-1900 (HA2); ϕ = 58° 2100-2400 (HA2)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 75 Flare: 0/20.9 Ca: no data Ip: 0 Ia: 3
Solar Regions		(14685) S03
Sunspots		

Mar. 19, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 5 Q8	Kp	0+ 2- 1+ 0+ 0+ 1+ 2+ 2+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- moderately bright W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 75 Flare: 0/23.6 Ca: 2.0 Ip: 0 Ia: 2
Solar Regions		14686 S21 (3) (14697) S29
Sunspots		S20 (19765) S30 (β)3

Mar. 20, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 13	Kp	4o 2+ 1+ 2o 1+ 2- 3o 4o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE bright W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 73 Flare: 0/23.2 Ca: 1.6 Ip: 0 Ia: 0
Solar Regions		14688 N18 (14698) N28
Sunspots		

Mar. 21, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 10 — Kp: 1o 2o 1+ 1o 1+ 3- 4o 3+ — sc

Aurora — USSR: ϕ = 59° 2100 (HB1) and 2200 (HA1) — W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE- — W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 0 10cm flux: 73 Flare: 1/22.4 Ca: 1.3 Ip: 0 Ia: 1

Solar Regions

Sunspots

Mar. 22, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 7 — Kp: 3- 2+ 3- 2o 1o 2o 1- 0o — sc

Aurora — USSR — W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE — W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 10 10cm flux: 75 Flare: 0/23.9 Ca: 1.2 Ip: 0 Ia: 2

Solar Regions — (14690) S14

Sunspots

Mar. 23, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 14 — Kp: 2- 1+ 3o 2o 3o 3o 3+ 4o — sc

Aurora — USSR: ϕ = 59° 0100-0300 (SA2), 0400-0600 (HA2) and 1900-2200 (HB1-2) — W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data SE- no data — W. Limb 7 days later: NW- SW-

Indices — Rz: 8 10cm flux: 75 Flare: 0/21.6 Ca: 1.7 Ip: 0 Ia: 4

Solar Regions — (14689) N15

Sunspots

Mar. 24, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 12 — Kp: 4+ 3o 2- 2- 2+ 2+ 2o 3- — sc

Aurora — USSR: ϕ = 58° 0100 (R_2B3) — W.E.

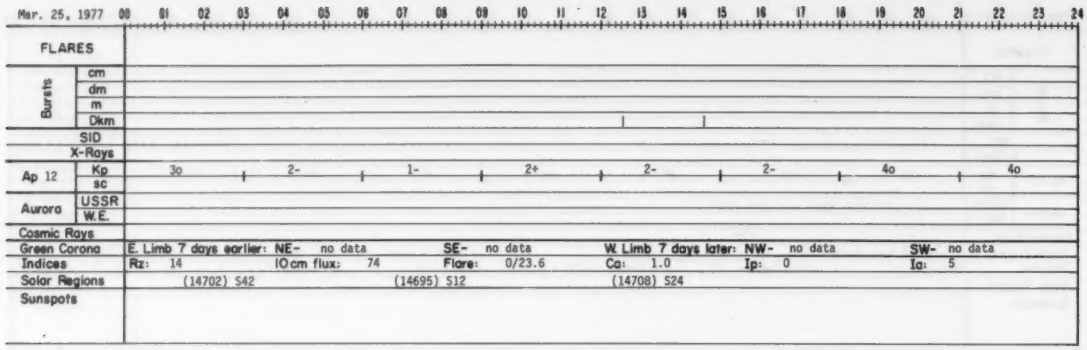
Cosmic Rays

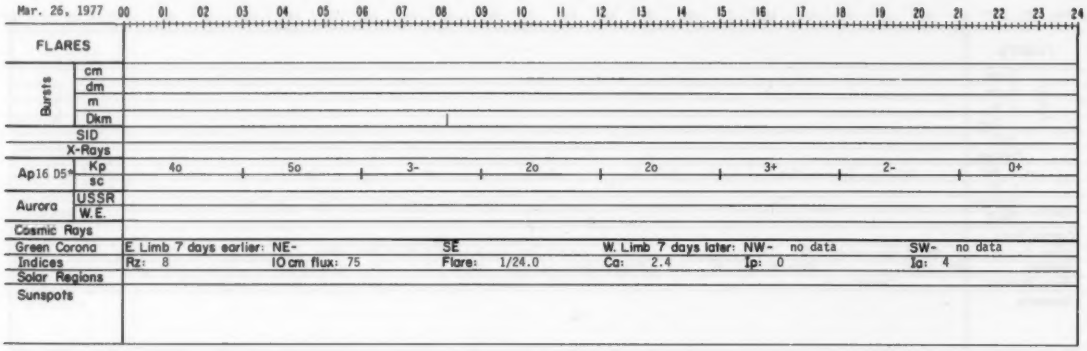
Green Corona — E. Limb 7 days earlier: NE- SE - — W. Limb 7 days later: NW- SW-

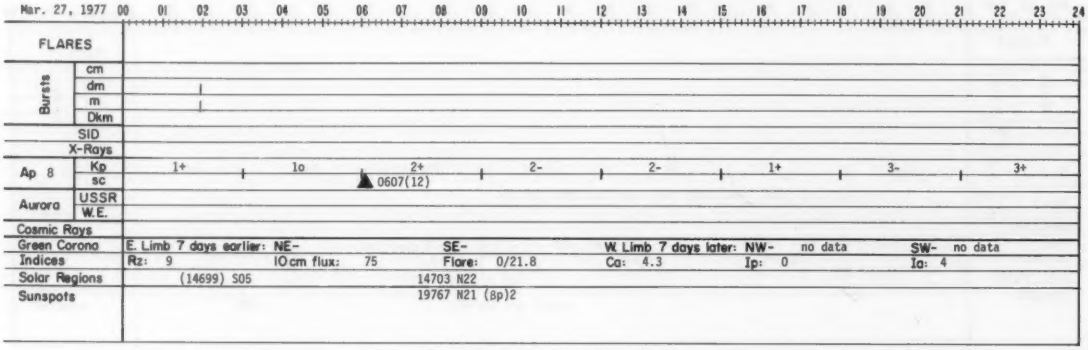
Indices — Rz: 7 10cm flux: 75 Flare: 1/23.8 Ca: 2.2 Ip: 0 Ia: 2

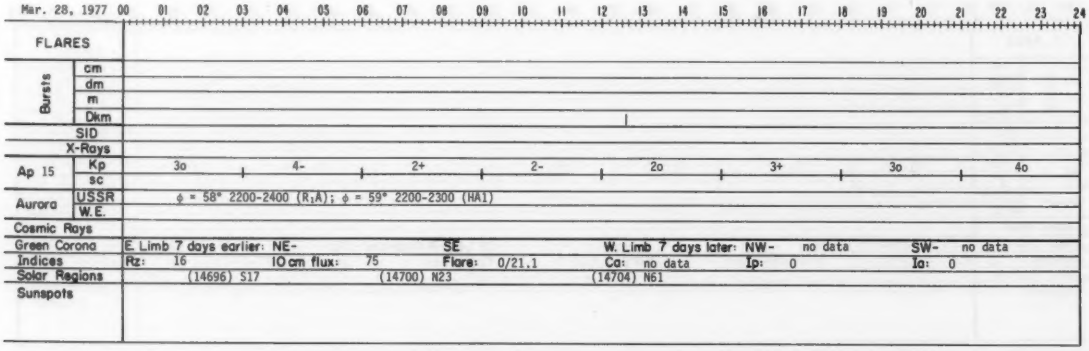
Solar Regions

Sunspots


Mar. 25, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 12
Kp
3o 2- 1- 2+ 2- 2- 4o 4o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 14 10cm flux: 74 Flare: 0/23.6 Ca: 1.0 Ip: 0 Ia: 5
Solar Regions
(14702) S42 (14695) S12 (14708) S24
Sunspots


Mar. 26, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap16 D5*
Kp
4o 5o 3- 2o 2o 3+ 2- 0+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 8 10cm flux: 75 Flare: 1/24.0 Ca: 2.4 Ip: 0 Ia: 4
Solar Regions
Sunspots


Mar. 27, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 8
Kp
1+ 1o 2+ 2- 2- 1+ 3- 3+
sc
0607(12)
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 9 10cm flux: 75 Flare: 0/21.8 Ca: 4.3 Ip: 0 Ia: 4
Solar Regions
(14699) S05 14703 N22
Sunspots
19767 N21 (Bp)2


Mar. 28, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 15
Kp
3o 4- 2+ 2- 2o 3+ 3o 4o
sc
Aurora
USSR
φ = 58° 2200-2400 (R;A); φ = 59° 2200-2300 (HA1)
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 16 10cm flux: 75 Flare: 0/21.1 Ca: no data Ip: 0 Ia: 0
Solar Regions
(14696) S17 (14700) N23 (14704) N61
Sunspots

Mar. 29, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 14	Kp	5- 4o 1+ 2- 3- 2+ 2+ 1o
	sc	
Aurora	USSR	ϕ = 59° 0000-0100 (SB2)
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 8 10cm flux: 76 Flare: 0/22.4 Ca: 7.8 Ip: 0 Ia: 1
Solar Regions		(14705) N01
Sunspots		

Mar. 30, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap5 Q9	Kp	0+ 1- 2o 2o 1o 2+ 1+ 2-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE-moderately bright SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 8 10cm flux: 75 Flare: 0/20.0 Ca: 7.9 Ip: 0 Ia: 2
Solar Regions		
Sunspots		

Mar. 31, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 4 Q3	Kp	2o 0+ 1- 1o 0+ 0+ 1o 1+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE-moderately bright SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 8 10cm flux: 74 Flare: 0/23.0 Ca: 6.4 Ip: 0 Ia: 0
Solar Regions		14701 N26
Sunspots		(19766) N26 (Bp)3 19768 N24 (af)3 CMP April 1

REGIONAL FLARE INDEX
INCLUDES ALL FLARES

HC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14666	N27	77/03/04.5	77/03/11	77/03/11	.85	.85	1
14674	N18	77/03/08.3	77/03/02	77/03/11	38.70	3.87	12
14686	S21	77/03/19.7	77/03/14	77/03/14	1.69	1.69	2
14698	N27	77/03/28.5	77/03/24	77/03/26	1.69	.56	2
14696	S16	77/03/28.1	77/03/21	77/03/21	.85	.85	1
14701	N26	77/03/31.7	77/04/03	77/04/03	1.95	1.95	1

Note:
Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

SGD 398 Part II (Comprehensive)

Miscellaneous Data

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SELECTED SOLAR EVENTS

JUNE 1977

Culgoora

UT Date 1977. June	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
2	0430	0433	43.25 80 160	1.5	295	0	2	unclf.	Possible II
4	2300	0500	80 160	1.2	95	ℓ	1	IS	This region persisted until 10th accompanied by type III activity.
	0044	0048	43.25 80 160	1.3	240	0	3	IIIG,V,U	*
6	0305	0306	43.25 80 160	.6	70	0	3 2 2	IIIGG	*Same region as type I.
23	0023	0032	80 160	1.2 1.1	90	0	2 1	II	
23/24	2300	0500	160	.5	180	r-R	1	IS	Type I persisted until 27th with varying polarization.
	0118	0122	43.25 80 160	.9	90	0	3 3 2	IIIG,V,U	*
24/25	2300	0500	80 160	1.2 1.1	55	ℓ	1	IS	Type I was visible on 24th but only at 160 MHz, then continued at 80, 160 MHz until 30th accompanied by type III activity

Days without Heliograph observations: Nil

*Other type III's observed from same position during the day.

SELECTED SOLAR EVENTS

Culgoora — **JUNE 1977**

UT Date 1977. June	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
28/29	2300	0500	80	.2	65	ℓ	1	I	Both regions on the 29th were doublets, only the first producing type III activity.
			160	.2 .3	85	ℓ	1	I	
			80	.4	225	ℓ	1	I	
			160	.3 .4	240	ℓ	1	I	
29/30	2300	0500	80 160	.7	25	ℓ	1	I	
			80 160	.6	50	r-unpol.	1	I	

Days without Heliograph observations: Nil

SELECTED SOLAR EVENTS

JULY 1977

Culgoora

UT Date 1977. July	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
30/1	2300	0500	80 160	.8 .7	320	L	1	I	This region persisted until 3rd.
2	0100	0500	160	1.2	70	Unpol-L	1	I	This region persisted until 7th, the polarization changing to L on 4th.
5/6	2300	0500	80 160 160	1.1 .9 1.0	315 300	L	1	I	After 03^h00^m second position only at 160 MHz.
7	0452	0454	43.25 80 160	1.0	320 315	0	3 2 2	IIIG	
10	0248	0316	43.25 80 160	1.3 1.1 .9	250	0	3 3 2	II	Possible weak IV from same region from 03^h16^m to 03^h32^m.
19/20	2258	2345	80	1.5 to 4.0	43	0	1	IV Moving	Flare occurred just prior to beginning of observations at 22^h58^m.
25	0353	0354	43.25 80 160	1.2 1.3 1.4	360	0	3 1 1	IIIB	

Days without Heliograph observations: Nil

*Other type III activity from this region during the day.

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

JULY 1977

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana)

The meaning of the station symbols is given in the IAGA-Bulletin nr. 32.
Times of ssc are mean values.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

06 1037: A: NU KS LM; B: WN DB FU EB KA KY; C: WI NI VI MT CZ KG DU
06 1345: A: SO WN KG; B: WI NI CI CZ (si: A: LM)
29 0027: A: SO DO NU WN WI DB VI FU EB CI FR KA KS KY LM KG DU; B: NI MT SS

Sudden impulses found in the magnetograms (si)

none

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

25 0840 - 0848 SO

Very unusual events

none

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